OCT 6 1922

Steel Prices Still Rising—Page 911

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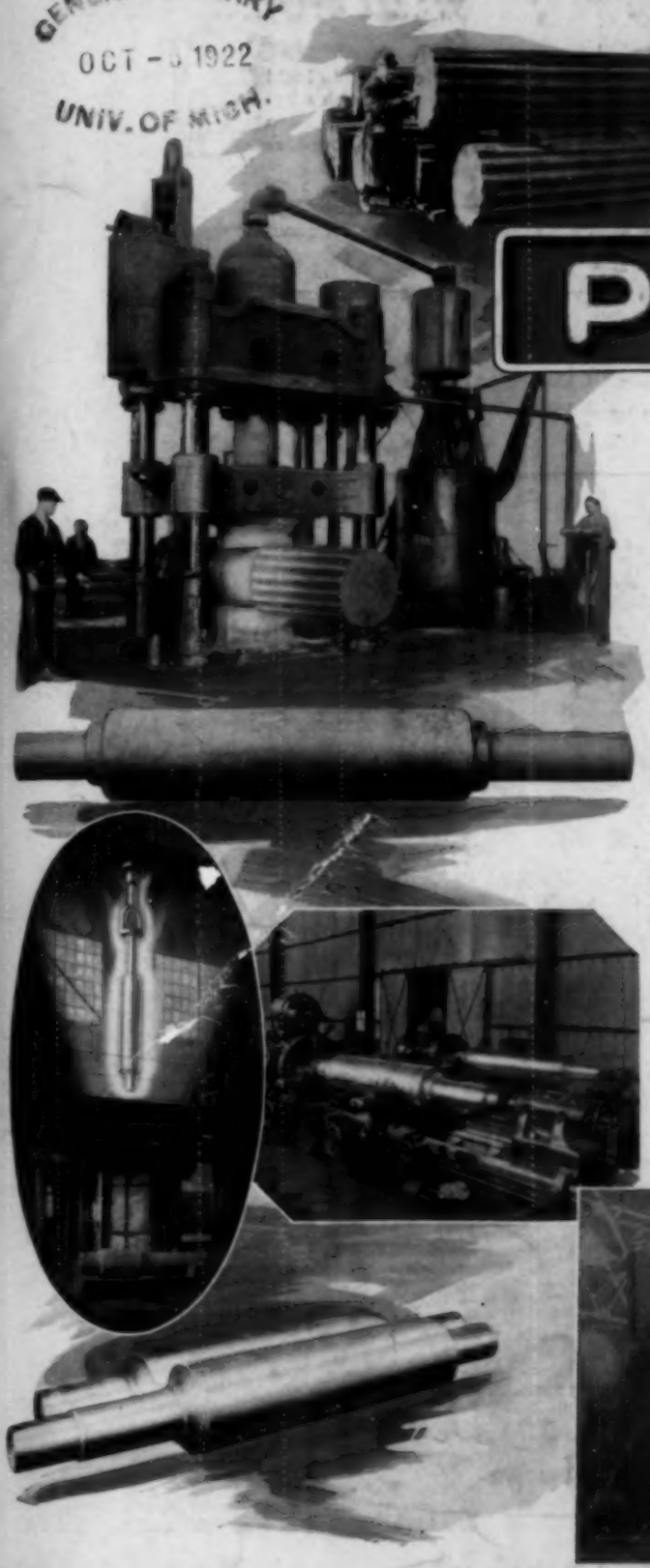

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The By-Product Coke Industry Moves Forward

The Carnegie Steel Company has awarded The Koppers Company a contract to build a 366 oven extension to their by-product and coke plant at Clairton, together with a by-product plant and benzol motor fuel recovery plant. This is important as an indication of the general upward trend of business and the continued abandonment of the bee-hive oven as a source of coke supply.

Even more important is the Carnegie Steel Company's decision to build the New Type Koppers Company Combination Oven, a logical sequence of the remarkable performance of this oven since it was first placed in operation less than nine months ago.

There are now 408 ovens of this new design in operation or under construction, as follows:

Carnegie Steel Company, Clairton, Penn'a.	366 ovens
Weirton Steel Company, Weirton, W. Va.	37 ovens
Chicago By-Product Coke Co., Chicago, Ill.	5 ovens
Total	408 ovens

Battery of five NEW KOPPERS OVENS at Chicago By-Product Coke Co., Chicago, Ill.

The KOPPERS COMPANY
Designers and Builders of By-Product Coke & Gas Ovens
PITTSBURGH, PA.

IRON TRADE REVIEW
Registration Applied For
The Authority of Industry National and International
Vol. LXXI Cleveland, October 5, 1922 No. 14

Mill Curtailment Being Forced

Transportation Difficulties Control Situation and Considerable Capacity Is Put Out of Commission—Blast Furnace Operations Show Remarkable Increase for Past Month, However, and Iron Production Gains—Railroads Place 1,500,000 Tons of Rails

STEEL mill operations this week have experienced more severely the pinch of the controlling transportation difficulties. A growing amount of finishing capacity has been forced out of commission because of a lack of raw material or a congestion of rolled products in makers' hands. Sheet and tin plate activities are 10 to 15 per cent lower due to these causes. Approximately 20,000 tons of sheets has been piled up on mill floors in the Mahoning valley. The movement of material from the mills by motor truck in the Pittsburgh and Youngstown districts now is extensive. The situation is complicated by embargoes, notable among which, because of its drastic character, is the 10-day ban on the receipt or transfer of all steel products put in effect Oct. 2, by the Pennsylvania railroad on its system from Altoona west.

A stronger desire to quietly book last quarter tonnage in such products as plates, shapes and bars is shown by some of the larger producers. In one case, 1.90c Pittsburgh on plates and bars and 2.00c on shapes with lower prices in special instances are being quoted. Another company is accepting 2.00c on bars and shapes and 2.10c on plates. In general these prices are a little lower than lately has been quoted. No signs of weakness are manifested by steel prices, however. Strip steel has been advanced $3 to $5 and hoops, bands and rivets $3 per ton. A higher list on nuts and bolts is out. One independent mill has advanced wrought pipe and another charcoal boiler tubes.

For the first time since the week of March 22, IRON TRADE REVIEW composite of fourteen iron and steel products shows a decline. This week it is $44.07 against $44.26 last week and $44.18 two weeks ago. The low point of the present year was $32.80.

Many Stacks Resume

A remarkable recovery of blast furnace operations from the effects of the rail and coal strikes is set forth by the pig iron production figures for September. The gain in active furnaces in the month was 45 to a total of 188 on the last day. This is the largest number of furnaces active since December, 1920, with the exception of June this year when 191 were blowing. Steelworks furnaces contributed 37 and merchant stacks 8 stacks of the gain. Total production of pig iron in September was 2,016,778 tons, an increase of 206,113 tons gross and of 8817 tons average per operating day over August.

Record Rail Bookings

After a rail buying movement which for magnitude of tonnage in a given time, has never been equaled in the steel industry, bookings for 1923 delivery total at least 1,500,000 tons. The bulk of this business was closed the past week. Outstanding individual contracts were 195,000 tons for the New York Central, 170,000 tons for the Pennsylvania and 40,000 tons for the Southern railroad. Western mills booked probably 750,000 tons for lines in their territory. Accompanying the heavy rail buying movement has been a comparable closing of track material and fastenings. In the Chicago district these orders total probably 150,000 tons and a similar scale of buying is reported from various districts. Car orders continue favorable, with new orders this week calling for about 5500 among which were 2000 for the Atlantic Coast Line, 1000 for the Chicago Great Western and 1500 for the Santa Fe. Pending inquiries total 15,000.

Iron Prices Easier

Further easing of the pig iron market is shown, particularly in the valley, Pittsburgh, Cleveland, Buffalo and eastern districts where the recent advance was more rapid. Basic is $2 to $3 lower in the valleys on the basis of definite sales and quotations. The selling activity of a western Pennsylvania steel company at lower prices has contributed to bring down the market at Pittsburgh and in the valleys. Eastern Pennsylvania consumers have closed for a large tonnage of basic including one lot of 15,000 tons at lower prices.

Foreign iron, notably low phosphorus, is penetrating as far west as Chicago and is forcing domestic makers to lower their prices to meet this competition. The new tariff has failed to halt sales of foreign iron to this country, IRON TRADE REVIEW'S market cable from London reporting 30,000 tons additional closed in the week. An eastern Pennsylvania steelmaker has closed for a round tonnage of foreign basic.

Business Trend and Chart Section Page 911

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Has the Public Been Protected?

THE federal trade commission holds that abandonment of the Midvale-Republic-Inland steel merger because of the complaint issued by it, is an admission of the correctness of its belief that the merger threatened a lessening of competition in violation of the federal trade act and therefore was unlawful. It strikes the attitude of having rendered the public a great service. The truth is that the commission, in all the criticism that has rolled back upon it, has never been so severely indicted.

The proposed merger has not fallen through from fear that the commission's complaint would be sustained. The department of justice gave not only its approval but also its blessing. The statement of Messrs. Corey, Topping and Block asserts that "all of the eminent counsel who have been consulted agree that the proposed merger would be legal in every respect and its consummation would not have restrained but would have intensified competition." From the strictly legal standpoint there were no doubts.

But it is stated: "The final determination of the questions involved would delay carrying out of the plans to such an extent that the parties in interest do not deem it advisable to proceed. Pending such final determination of questions involved, the financing of the proposed merger would not be possible and it is not feasible to proceed with the merger without such financing." In other words, the bankers were not willing to put their dollars into a project, no matter how meritorious, subject to indefinite delay and prosecution by the commission.

The complaints of the trade commission are not indictments; they are merely statements that the commission has "reason to believe" the law is being fractured. The sequel to a complaint is a long drawn-out hearing. Meanwhile, no matter if the complaint should be groundless, the orderly processes of business and industry must await the final determination. The complaint in the Bethlehem-Lackawanna case was issued June 5 and the commission is not yet ready to proceed. The Claire Furnace cost reporting case was instituted in June, 1920, and will be at least 18 months more in receiving the final judgment of the Supreme Court. The Pittsburgh basing point case has been hanging fire since the summer of 1919 and may yet rival Jarndyce vs. Jarndyce.

The commission has won neither a legal nor a moral victory. It has not crossed arms with opposing legal talent; its legal objections to the three-company merger have been challenged but not combatted. The commission, essentially a legal body, has cowed a coterie of bankers by threats of indefinite litigation. The Bethlehem Steel Corp. purchased the capital stock of the Lackawanna Steel Co. and did no financing. The three-company merger, revolving upon two financial transactions—the absorption of the Inland company by Midvale and the consequent acquirement of Republic—was more sensitive.

The commission intends to proceed in the Bethlehem-Lackawanna case. The attorneys of the commission are of the opinion that they have a stronger case, from the standpoint of the provisions of the federal trade act, against the two-company merger than they have against the one now abandoned. A decision adverse to the commission in the Bethlehem-Lackawanna case will imply that it would not have won in the three-company complaint. With the department of justice on record as stating that "instead of being in restraint of trade the new combination will be in furtherance of trade" the commission may be called upon to explain its alleged victory. This is especially so, since it is clear to all students of practical economics that one of the basic impulses to the present merger is ability to more actively and broadly compete with the Steel corporation.

Wheat's Advance Is Favorable

ONE of the most vital questions of the moment bearing upon the immediate outlook for business is that of the probable purchasing power of farmers this fall. Industry has been cheered by the recurrent reports of excellent growing crops and the

promise of a greater abundance of harvests this year than in 1921. The farmers, however, have not shared greatly in this enthusiasm. The reason is plain. Since July the prices of wheat, corn and other foodstuffs have fallen, in some cases precipitately. Wheat declined more than 20 cents a bushel to below $1. The price received on the farm was much less.

At the same time farm values were tumbling, other commodity prices have been rising. Coal, steel, building materials, and clothing all are higher than they were in the summer when wheat started to decline.

Recently a new influence boldly injected itself into the situation, in the person of Mustapha Kemal. The specter of war in Europe had an immediate influence upon wheat and values have advanced about 10 cents a bushel. Even without the Turkish war threat, grain prices evidently were too low in view of world conditions. An estimated decrease of 63,000,000 bushels of wheat in the world's stored up supplies is shown compared with 1921. The world crop is 40,000,000 bushels less than last year and in Europe the harvest promises to yield 138,000,000 bushels less. All this means sustained demand for food from the exporting nations, of which this country is at the forefront.

Although exports of American farm products are less than they were during the war, they are still far above the prewar level in most instances, and there is no immediate indication of sharp curtailment. All things considered it seems probable that the slump of farm products has been halted and that conditions are shaping themselves more favorably for the farmer. All business will benefit from such a development.

Tungsten Stocks Offset Tariff

WITHIN the past two months tungsten prices have recorded a sensational advance, more than 100 per cent, reflecting the tungsten duties embodied in the new tariff act. The duties are as follows: Concentrates, 45 cents a pound of metallic tungsten contained, equivalent to $7.14 a short ton unit; ferrotungsten and tungsten metal powder, 60 cents a pound contained and 25 per cent ad valorem. When it first became evident that these duties would inevitably become effective, tungsten prices were as follows: Concentrates, $3 a short ton unit; ferrotungsten and tungsten powder, 40 to 45 cents a pound. Then buying, for investment by consumers, and for speculation by dealers, brought about a sharp rise in prices, until the market reached current levels of $7.50 to $8 for concentrates; 80 to 85 cents for ferrotungsten; and 85 cents to $1 for powder. Even with the price at $1, the duty would be prohibitive. European ferrotungsten might be imported at a shade under 40 cents c.i.f. American port, but with the new rate of duty, the selling price would have to be around $1.15. With ore at $7.50 to $8, domestic makers figure they would have to sell the alloy at 95 cents to $1.

To date the benefit of the duty has accrued principally to the holders of tungsten in various forms in this country. It is estimated there are about 12,000 tons or fully two years supplies of concentrates in this country, some of which represents an original cost of $20 a unit or more. During the war this mercurial commodity sold as high as $100 a unit and since the war has sold down to $1.75 to $2 a unit. Among the principal holders of tungsten are banks, which took over the material they held as collateral when its market price declined to less than the loans.

Domestic miners cannot operate with ore at present levels. Few of them can operate profitably under $12 unit. At that price it probably will be practicable to import Chinese or South American ores and pay the duty. In fact, it is believed by students of the tungsten business that when the bulk of the present stocks are off the market, it will become necessary to augment domestic supplies with imported tungsten to the amount of 30 per cent or more of the country's requirements, either in the form of ore or manufactured product.

When Discards Find Favor

A SOMEWHAT freakish development, which is alluded to in the wire market reports in this issue is the fact that output of finished wire and nails has decreased during the past couple of weeks despite an increase in the production of semifinished steel at these plants. This contradiction of the usual relation is the outgrowth of the conditions brought about by the coal strike. After the inception of the coal strike, considerable time elapsed before wire production became seriously affected. When it became necessary to shut down steelmaking units for lack of coal, wire mill operations were maintained at a disproportionately higher rate owing to the use of such semifinished steel as normally would be rejected by the wire mill superintendent. Normally, every mill has on hand considerable tonnage of steel which is set aside in favor of material whose use permits a maximum output of finished material. It was by using short billets and discards that the wire production has been maintained lately at a level considerably higher than the steel output alone would have supported.

Practically all the stocks of this material have been exhausted so that wire production now is in direct proportion to the steel output. In view of the fact that steel output still is lagging, however, everything that comes from the steel works is being worked up in the finishing plant. Current market conditions indicate several months will elapse before wire mill superintendents again can enjoy the privilege of rejecting billets for one reason or another. Similar conditions have prevailed in other finished mills. Manifestly a time of stringency in steel supplies offers the mill a good opportunity to clean up stocks of material which ordinarily would be in small favor for high speed operations.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

October 3, 1922	September 27, 1922	September, 1922	July, 1922	October, 1921	October, 1913
$44.07	$44.26	$43.79	$37.50	$35.46	$24.91

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Composite Market Record by Months for Nine Years on Page 954

SCRAP PRICES, PAGE 956, WAREHOUSE, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 952

Iron and Steel Prices

Pig Iron

Bessemer, valley	$34.00
Bessemer, Pittsburgh	35.77
Basic, valley	31.00 to 32.00
Basic, Pittsburgh	32.77 to 33.77
Basic, Buffalo	32.00
Basic del., eastern Pa.	29.60 to 30.00
Malleable, valley	34.00
Malleable, Pittsburgh	35.77
Malleable, Chicago	32.00
Malleable, Buffalo, furnace	32.00
Malleable, del., eastern Pa.	33.00 to 34.00

FOUNDRY IRON SILICONS

No. 2 Northern	**1.75 to 2.25**
No. 2 Southern foundry	**1.75 to 2.25**
No. 2X East'n and Virginia	**2.25 to 2.75**
No. 1X Eastern	**2.75 to 3.25**
No. 1 Chicago	**2.25 to 2.75**
No. 2 foundry Eastern	**1.75 to 2.25**

No. 1X, eastern del. Phila.	35.13 to 36.23
No. 1X, Buffalo	34.00
No. 2 foundry, valley	33.00 to 34.00
No. 2 foundry, Pittsburgh	34.77 to 35.77
No. 2 foundry, Buffalo	32.00
No. 2 foundry, Chicago	32.00
No. 2 foundry, Granite City	**33.00 to 34.00**
No. 2 foundry, Ironton furnace	34.00 to 35.00
No. 2 foundry, Cleveland del.	35.00 to 35.50
No. 2 foundry, del., Phila.	32.13 to 33.26
No. 2 foundry, N. J. tidewater	32.39 to 33.76
No. 2X, eastern del., Phila.	33.13 to 34.26
No. 2X, east. N. J. tidewater	33.39 to 34.76
No. 2X, eastern del. Boston.	36.65 to 38.65
No. 2X, foundry, Buffalo fur.	33.00
No. 2X, Buffalo del. Boston	37.91 to 38.91
No. 2 southern, Birmingham	28.00 to 30.00
No. 2 southern, Cincinnati	32.05 to 34.05
No. 2 southern, Chicago	36.01 to 38.01
No. 2 southern, Philadelphia	**35.80 to 37.80**
No. 2 southern, Cleveland	34.00 to 36.00
No. 2 southern, Boston	34.89 to 37.60
No. 2 southern, St. Louis	33.67 to 34.17
No. 2X, Virginia furnace	33.00
No. 2X, Virginia Philadelphia	38.17
No. 2X, Virginia Jersey City	38.54
No. 2X, Virginia Boston	38.92
Gray forge, eastern Pa.	**31.50 to 32.50**
Gray forge, val. del. Pitts.	33.77 to 34.77
Low phos., standard, valley	37.00 to 38.00
Low phos., standard, Phila.	41.00
Low phos., Lebanon furnace	35.00 to 37.00
Charcoal, Birmingham	32.00 to 35.00
Charcoal, Superior, Chicago	**36.15**

Silvery Iron
6 per cent base

Jackson county, O., furnace	$41.50
Tennessee, Chicago delivery	Nominal
Ohio brands, Chicago	46.29

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	$49.50 to 50.50
11 per cent	52.80 to 53.80
12 per cent	56.10 to 57.10
13 per cent	58.00 to 59.00
14 per cent	66.10 to 67.10

Ferroalloys

Ferromanganese, delivered, Pittsburgh	$105.89
xFerromanganese, 80 per cent, English, c.i.f. Atlantic port	101.10
Ferromanganese, 80 per cent, German, c.i.f. Atlantic port	Nominal
Spiegel, 19 to 21 per cent furnace spot nominal	38.00 to 39.00
xSpiegel, 20 per cent English, c.i.f. Atlantic port	39.25
Ferrosilicon, 50 per cent contract freight allowed	65.00 to 70.00
Ferrotungsten, standard, per pound contained	75.00 to 85.00

xDuty paid

Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, per pound contained, makers plant	12.00c to 14.00c
Imported ferrochrome, 4 to 6 per cent carbon	10.00c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$12.00 to 12.50
Connellsville foundry	13.50 to 14.50
Pocahontas furnace	12.00 to 13.00
Pocahontas foundry	nominal
New River furnace	11.00 to 12.00
New River foundry	14.00 to 15.00
Wise county furnace	11.50 to 12.00
Wise county foundry	13.00 to 13.50
Alabama furnace	8.00 to 9.00
Alabama foundry	9.00 to 10.00

By-Product

Foundry, Newark, N. J., del.	$14.84 to 16.02
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	16.50
Foundry, Granite City, Ill., ovens	14.00
Foundry, Alabama	8.50 to 9.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$40.00 to 45.00
Open-hearth, Youngstown	40.00 to 45.00
Open-hearth, Philadelphia	45.17
Bessemer, Pittsburgh	40.00 to 45.00
Bessemer, Youngstown	40.00 to 45.00
Forging, Pittsburgh	45.00 to 50.00
Forging, Philadelphia	50.17 to 52.67

SHEET BARS

Open-hearth, Pittsburgh	$40.00 to 45.00
Open-hearth, Youngstown	40.00 to 45.00
Bessemer, Pittsburgh	40.00 to 45.00
Bessemer, Youngstown	40.00 to 45.00

SLABS

Pittsburgh and Youngstown	$40.00 to 45.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$45.00 to 47.50
Grooved skelp, Pittsburgh	2.00c to 2.50c
Universal skelp, Pittsburgh	2.00c to 2.50c
Sheared skelp, Pittsburgh	2.00c to 2.50c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.00c to 2.25c
Structural shapes, Phila.	2.325c to 2.425c
Structural shapes, New York	2.34c to 2.44c
Structural shapes, Chicago	2.10c to 2.25c
Tank plates, Pittsburgh	2.00c to 2.50c
Tank plates, Philadelphia	2.325c to 2.575c
Tank plates, New York	2.34c to 2.59c
Tank plates, Chicago	2.10c to 2.30c
Bars, soft steel, Pittsburgh	1.90c to 2.25c
Bars, soft steel, Philadelphia	2.225c to 2.425c
Bars, soft steel, New York	2.24c to 2.44c
Bars, soft steel, Chicago	2.00c to 2.25c
Bars, forging, Pittsburgh	2.60c
Bars, rail steel, Chicago	2.10c
Reinforcing bars, Pittsburgh	2.00c to 2.25c
Bar iron, common, Phila.	2.325c to 2.575c
Bar iron, common, New York	2.34c to 2.59c
Bar iron, common, Chicago	2.50c

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.90c to 3.50c
Bands, Pittsburgh	2.90c to 3.50c
Cotton ties, per bundle Pittsburgh	$1.13
Cold finished steel bars, Pitts- burgh base	2.50c to 2.75c

Rails, Track Material

Standard bessemer rails, mill	$40.00
Standard open h-arth rails, mill	40.00
Relaying rails, St. Louis	28.00 to 35.00
Relaying rails, Pittsburgh	27.00 to 30.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.85c to 3.00c
Spikes, small and boat	3.50c to 3.75c
Spikes, railroad, Chicago	2.85c to 3.00c
Track bolts, Pittsburgh	3.85c to 4.50c
Track bolts, Chicago	3.85c to 4.00c
Tie plates, Pittsburgh	2.25c to 2.50c
Tie plates, Chicago	2.35c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.70c
Plain wire, Pittsburgh	2.45c
Galvanized wire, Pittsburgh	2.95c
Barbed wire, painted, Pitts.	2.85c
Barbed wire, galv., Pittsburgh	3.35c
Polished staples, Pittsburgh	2.85c
Galvanized staples, Pittsburgh	3.35c
Coated nails, count keg, Pitts.	2.20c

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.05c to 2.55c
Hot rolled strip steel, Pitts- burgh stamping quality	2.90c to 3.50c
Cold rolled strip steel, hard coils, 1⅛ inches and wider by 0.100- inch and heavier, base	4.50c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.75c
No. 28, bessemer, Pittsburgh	3.35c to 3.75c
No. 28, open-hearth, Phila.	3.675c to 3.825c
No. 28, open-hearth, Chicago	3.64c to 3.69c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.75c
No. 28, open-hearth, Chicago	3.69c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.35c to 4.75c
No. 28, bessemer, Pittsburgh	4.35c to 4.75c
No. 28, open-hearth, Phila.	4.675c to 4.825c
No. 28, open-hearth, Chicago	4.64c to 4.69c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.50c to 2.85c
No. 10, bessemer, Pittsburgh	2.50c to 2.85c
No. 10, open-hearth, Phila.	2.825c to 3.075c
No. 10, open-hearth, Chicago	2.84c to 2.89c

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	68	56½
1 to 1½-inch, butt iron	34	19

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c. l.	50 off
Charcoal iron, 3¼ to 4½ inches l. c. l.	21 off
Seamless, hot rolled, 3¼ to 4-in., l. c. l.	47 off

Cast Iron Water Pipe

Class B Pipe

Fourinch, Chicago	$56.20
Six-inch and over, Chicago	52.20
Four-inch, New York	60.80
Six-inch and over, New York	55.30
Four-inch, Birmingham	47.50 to 48.00
Six-inch and over, Birmingham	43.00 to 43.50
Three-inch, Birmingham	56.50 to 57.00

Class A pipe is $4 higher than Class B.
Standard fittings, Birmingham, base..$100.00
6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Oct. 4, 1922	Sept. 1922	July 1922	Oct. 1921
PIG IRON				
Bessemer, valley, del., Pittsburgh	$35.77	$35.27	$26.76	$22.06
Basic valley, del., Pittsburgh	33.77	34.27	26.76	21.16
*No. 2 foundry, del., Pittsburgh	34.77	37.02	26.16	22.96
*No. 2 foundry, Chicago	32.00	32.00	24.65	21.50
Lake Superior charcoal, Chicago	36.15	36.15	31.65	32.50
Malleable, valley	34.00	34.00	24.25	20.25
Malleable, Chicago	32.00	32.00	24.65	21.50
*Southern No. 2, Birmingham	28.00	26.25	18.50	19.00
*Southern Ohio, No. 2 Ironton	34.00	33.75	24.15	21.00
Basic eastern del., eastern Pa.	29.75	30.00	26.00	20.50
**No. 2X, Virginia furnace	33.00	33.00	26.00	23.25
**No. 2X, eastern del. Phila.	33.76	34.25	27.90	22.00
Gray forge val. del., Pittsburgh	33.77	36.02	25.76	21.96
Ferromanganese, del., Pittsburgh	105.89	80.69	72.29	61.65
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh	40.00	39.50	35.00	31.50
Sheet bars, open-hearth, Pittsburgh	40.00	39.50	35.00	31.50
Billets, bessemer, Pittsburgh	40.00	39.50	35.00	30.00
Billets, open-hearth, Pittsburgh	40.00	39.50	35.00	30.00
FINISHED MATERIAL—				
Steel bars, Pittsburgh	2.00	2.00	1.70	1.60
Steel bars, Chicago	2.00	1.98	1.75	1.75
Steel bars, Philadelphia	2.325	2.375	2.025	1.95

	Oct. 4, 1922	Sept. 1922	July 1922	Oct. 1921
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.325	$2.325	$2.00	$1.95
Iron bars, Chicago mills	2.50	2.25	1.80	1.75
Beams, Pittsburgh	2.00	2.00	1.70	1.60
Beams, Philadelphia	2.325	2.375	2.025	1.95
Beams, Chicago	2.10	2.08	1.75	1.78
Tank plates, Pittsburgh	2.10	2.20	1.70	1.60
Tank plates, Philadelphia	2.425	2.575	2.025	1.95
Tank plates, Chicago	2.10	2.08	1.75	1.78
Sheets, blk., No. 28, Pittsburgh	3.50	3.40	3.15	3.00
Sheets, blue anl., No. 10, Pitts.	2.60	2.50	2.40	2.50
Sheets, galv., No. 28, Pittsburgh	4.50	4.40	4.15	4.00
Wire nails, Pittsburgh	2.70	2.70	2.40	2.90
COKE—				
Connellsville furnace, ovens	13.50	11.00	10.65	3.25
Connellsville foundry, ovens	13.50	12.75	11.40	4.50
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	21.50	19.50	16.60	14.00
Heavy melting steel, east. Pa.	18.00	17.10	15.00	12.25
Heavy melting steel, Chicago	18.50	18.15	15.10	12.50
No. 1 wrought, eastern Pa.	22.50	21.25	18.25	15.85
No. 1 wrought, Chicago	20.50	19.95	15.20	14.65
Rails for rolling, Chicago	20.50	19.40	16.00	14.00

*1.75 to 2.25 silicon **2.25 to 2.75 silicon

Pig Iron Prices Show Declines

Recession of Market Develops in Various Districts—Foreign Offerings Are a Factor—Valley Basic $2 to $3 Lower—Eastern Steelworks Buy Tonnage—Traffic Conditions Still Harrss Industry—Inquiry Is Quieter

Philadelphia, Oct. 3.—Foreign competition is causing further recession of prices of eastern pig iron. Eastern Pennsylvania foundry now obtainable in attractive quantities at $31 base furnace, although this figure is exceptional. The market now is $31 to $32 base furnace. Good tonnages are reported booked. The biggest business involves a large tonnage of basic at slightly under $30 delivered eastern Pennsylvania. One consumer bought 15,000 tons of basic. Foundry iron continues to sell in small lots at $33 base. Considerable additional foreign foundry was sold at the prices reported last week. It now is difficult to get foreign foundry for shipment from abroad before November. An eastern Pennsylvania consumer bought a big tonnage of foreign basic but no details were given. Low phosphorus is featureless. Eastern malleable is quoted at $32 to $33 furnace. About 10,000 tons of Virginia foundry has been sold for fourth quarter delivery at $32 base furnace plus $1 differential. At least two Virginia stacks are expected to blow in this month and probably two others shortly after.

Inquire for First Quarter

Chicago, Oct. 3.—Inquiry for pig iron is steady and mostly for small lots for prompt and some for fourth quarter delivery. Some first quarter inquiry also has appeared but there are no sales. Quotations are unchanged at $32 for No. 2 foundry and malleable. Inland Steel Co. has blown in an additional stack but no merchant iron has been available from that source for sometime. The car supply is irregular and delays shipment though a modification of the existing rules permits loading of empty coal cars back with iron. In some cases shipments now are close to production. Sales include 600 tons of foundry to a Minnesota user for fourth quarter. Most sales involve a carload to 100 tons. Low phosphorus iron is in small demand. The price is uncertain but the English grade offered at $31 seaboard is furnishing competition. Domestic iron probably is quotable at $43 Chicago. Milwaukee furnace is expected to make this grade for western users. Silveries are quiet and unchanged. Southern is quoted at $29 to $30 with little selling as shipments still are held back. It develops the Andrews Steel Co. placed its recent order for basic with a southern furnace, understood to be the Woodward Iron Co., at $31 delivered.

Embargoes Hinder Shipments

Pittsburgh, Oct. 3.—Embargoes, chiefly the general ban inaugurated this week by the Pennsylvania railroad against pig iron, steel and allied products, are the

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matter of chief moment in the pig iron market. Car shortages too are being felt in numerous instances, but shippers are asking the consignees obtain special permit so that deliveries can be made. The Cambria Steel Co. still quotes low prices on pig iron, f. o. b. Youngstown, as compared with the valley market and it has the same freight to Pittsburgh points as from the valleys, $1.77. Its quotations remain unchanged at $30.50, $32.50, $33.50 and $32.50 on basic, malleable, bessemer and No. 2 foundry iron respectively. It is understood that during the past week the Allegheny Steel Co. purchased 500 tons of bessemer at $32 furnace, on an old quotation. Several other 500-ton lot sales of various grades are noted but buyers generally are not purchasing for distant requirements. Inquiries this week are at a minimum. The sale of valley basic iron involving 2000 tons to a melter in the Pittsburgh district is noted at $33.50 valley. A sale of basic by Cleveland producers has been made at approximately $32 valley basis. Bessemer remains $34 valley: No. 2 foundry (1.75 to 2.25 silicon) has been sold in round tonnage lots at $33 valley for extended delivery. Smaller lots for prompt shipment have carried prices of $34 to $36 valley. Practically no interest is found in malleable and the valley price remains unchanged at $34.

Average sales prices on bessemer and basic pig iron during September as compiled by W. P. Snyder & Co., registered further advances. They were $33.50 and $32.93 respectively in September as against $28.67 and $25.41 in August. The September averages are higher than at any time during 1921 and 1922, the nearest approach being made in January, 1921 when they were $32 and $30 respectively.

Basic Market Is Defined

Cleveland, Oct. 3.—An easier market continues to develop in pig iron subject to transportation conditions which remain the principal factor of the moment. While in spots the car situation is a little better this week, it is very erratic and the producers continue to be delayed in making deliveries with the result that some further iron is being piled. New business is dropping off considerably and fresh inquiry is light. The recent more or less nominal market on basic has been clarified by a sale of 5000 tons to a Weirton, W. Va. consumer at approximately $32 valley, the iron to come from a Cleveland producer. Other negotiations involving some thousands of tons have been under way and on these considerably less than $32 valley has been named. It is apparent that $31 to $32 is fairly representative of the market. An inquiry for 1500 tons of basic for Massachusetts delivery appeared in this district during the week. Some further sales of Cleveland foundry iron were made this week at $35 furnace, but the market is now quoted at $34.50 to $35. Some producers in nearby territory continue to quote a range of $32 to $33.50 base furnace for foundry and malleable, depending upon the location of the buyer. Malleable shows strength with carload sales at $35 local furnace and one lot of 500 tons was booked this week at a higher figure. Sales of Jackson county silveries in this district this week total 1000 tons up to $44.50 and above

Extended statistics of European iron and steel production, American iron and steel exports and imports, page 954

for 9 to 10 per cent. Some consumers of iron are beginning to inquire for next year and it is reported sales have been made for that delivery at about $1 below the current level. Some merrying of contracts under which some iron at prevailing high prices is shipped with old low price orders is being insisted upon by the furnaces. This is following out a similar precedent under the falling market of 1921 when melters forced the furnaces to write down their contract obligations in this way. British low phosphorus iron which is selling at the basis of $30 to $31 tidewater is making its way into this and other western districts, even as far as Chicago. As a result the domestic price is easier and $37 to $38 valley now prevails. Furnace operations have been increased this week by the blowing in of the last and fourth stack of the McKinney Steel Co. group in this city and the Erie, Pa. furnace of Pickands, Mather & Co.

Prices Softer in East

New York, Oct. 3.—Pig iron prices have softened in the past week, both on domestic and foreign iron. English and continental foundry iron, equivalent to American standard 2.25 to 2.75 silicon grade, now can be had with ease at $27, c.i.f. tidewater. High phosphorus, high sulphur foreign iron can be had at $22, c.i.f. tidewater, but there are few takers for this grade. Most of the current business in foreign iron continues to involve English and continental foundry. Some Scotch iron also is selling at around $30, tidewater, for 2.50 to 3 per cent silicon. Eastern Pennsylvania foundry now is selling at $31 to $32, base furnace, plus the usual differentials. Some Buffalo foundry now can be had at $32, base Buffalo. Considerable Duluth malleable iron has been sold for shipment on lake carriers to Buffalo and for trans-shipment to eastern points. This iron now is bringing $32 to $33, Buffalo. Central Pennsylvania foundry is bringing $33 to $34, furnace. A second Virginia maker has opened its book for fourth quarter and is quoting the same as the leading Virginia interest, $32 base furnace, plus $1 silicon differentials, excepting that it is asking manganese differentials also. Furnace operations are increasing as a result of the more plentiful supply of coke. The Alleghany Ore & Iron Co. is about to blow in its furnace at Buena Vista, Va. The Virginia Iron, Coal & Coke Co. is expected to blow in a furnace within a day or two. The Punxatawney furnace went in blast last week and the Colonial furnace at Riddlesburg, Pa., also now is active.

Buffalo Prices Softer

Buffalo, October 3.—The feature of this week's market is the softening of the prices to a base of $32. The range under this base is $33 for 2.75 to 3.25 silicon and $34 for 2.75 to 3.25 silicon. The malleable quotation is $32. Quotations of $31 are reported in this market but no record of actual sales has been found. The easing off of the market is attributed to an influx of foreign iron and the determination by a certain seller to obtain a good percentage of the going tonnage. Inquiries are for 500 tons and less. One furnace reports total sales at 2500 tons but most producers have sold less. Some lots of No. 2 (2.25 to 2.75 silicon) have been sold as high as $34 but the amount has been trifling.

Lapses Into Dullness

Cincinnati, Oct. 3.—After absorbing approximately from 6000 to 10,000 tons of new pig iron business during the past week, the local market lapsed into dullness, marked by an abrupt falling off in buying and an impressive absence of inquiry. Reported sales include two 1000 ton lots of southern No. 2 foundry (1.75 to 2.25 silicon) and 400 tons of malleable to Illinois consumers; 100 tons of southern foundry to a consumer in southern Indiana; 100 tons and 150 tons for shipment to central Ohio points; and 100 and 300 tons of southern and 400, 200 and 300 tons of northern foundry to consuming points in southern Ohio. Cincinnati melters shared in the purchases, marking their first market activities in several weeks. In addition, there was moderate buying of carload lots. There are before the trade limited inquiries for varying lots up to 1000 tons, including that of a consumer at Knoxville for 200 tons and another Tennessee melter for 250 tons, both specifying southern No. 2. Shipping conditions show considerable improvement and the tonnage movement is increasing. Some iron is being delivered on old contracts, although this is limited. The Southern railroad is not yet moving much iron but the Louisville & Nashville is bringing considerable tonnage into the territory north of the Ohio river. But for the continued scarcity and high cost of coke, softness in the iron market might be expected, but material increased production, particularly in the North, still is remote and prices are firm. In southern Ohio $34 is the recognized minimum base price with a $35 maximum, at which practically all fourth quarter offerings are being quoted. While most of the southern furnaces still are out of the market two or three in Alabama and Tennessee have iron that can be bought on a $28 base, Birmingham, but others are holding at $30.

Small Sales the Rule

Boston, Oct. 3.—Despite some round tonnage business placed during the week, a buying lull in the New England pig iron market is reported by several dealers. Apparently the bulk of consumers is well covered for the next 30 or 60 days by orders already placed. It remains to be seen whether shipments will come through as rapidly as expected before much additional buying takes place. Undoubtedly an acute car shortage would bring a large number of consumers into the spot market. Even as it is, spot sales from $5 to $8 above the last quarter price have been reported. Eastern Pennsylvania iron is offered at $32 base furnace but the tonnage sold is

small. Buffalo furnace interests have been selling a fair tonnage of malleable at $32 furnace or $36.91 delivered. A few sales of No. 2X Buffalo iron at this same price of $32 furnace are reported. Foreign iron is offered for future delivery at from $27 to $30 c.i.f. Boston. Recent sales include 600 tons to a western Massachusetts valve manufacturer, 250 tons to a Rhode Island melter, 2000 tons to a Connecticut melter, 1200 tons to an eastern Massachusetts foundry, and scattered lots of from 200 to 300 tons and less bring the total close to 7000 tons.

Buying Is Active

St. Louis, Oct. 2.—Melters in this district are buying pig iron only for immediate needs and in small quantities with the result purchases have been light within the last week. This attitude is due to the higher prices of iron and realization of the fact that it is most difficult to get orders placed or to get them shipped. But the buying is active and the market shows no signs of weakness here. Northern iron is still at $32, base Chicago, but little is coming through. The Granite City maker is working on basic and has only a supply of foundry iron of low silicon on hand, from which it has sold between 1000 and 1500 tons. The same maker has had inquiries involving from 5000 to 15,000 tons of basic from melters normally served by other territories. Congestion at Birmingham is acute, and the only iron from the South that is coming through is being shipped by the Sheffield maker, which is moving about 1500 tons weekly to this territory by barge to Metropolis, thence by rail. This maker virtually is out of the market and the present movement is on old orders. Its price is $30, but the price of all-rail shipments is from $28 to $29.50, Birmingham.

Southern Market Spotty

Birmingham, Ala., Oct. 2.—While the southern pig iron market may be termed spotty, sales of from 1000 to 10,000 tons each are reported. The latter being for basic. The probable make for the last quarter is well sold up. Production is being kept up to the pace set two weeks ago. The Alabama Co., is now getting in material to repair the second furnace at Gadsden. The car supply is affecting the shipping of iron. One maker is behind 40,000 tons on deliveries. The Woodward Iron Co. is permitting the use of its own cars for hauling iron to Anniston, North Birmingham and elsewhere. Quotations are given at $27.50 to $28.50. With some inquiries being answered at $30. Regular customers are making contracts at lower prices. Inquiries again are reported for first quarter though no sales are reported.

The capital stock of the Ohio Steel Castings Co., Cleveland, which acquired control of the Aetna Steel Castings Co. last October, has been increased to $100,000 8 per cent cumulative preferred stock and 1000 shares of no par common to provide additional working capital. An offering of the stock is being made on a basis of one share of preferred and one of common for $100.

Coke Scarcity Continues

Increased Production Affords Small Relief—Foundry Price up $1.50—Car Placements Only 20 to 30 Per Cent

COKE PRICES, PAGE 890

Pittsburgh, Oct. 3.—Difficulty still is met with by the blast furnace operator in the market for beehive coke. This situation is sustained because while production has increased somewhat among merchant ovens, there still are several avenues available for the disposition of every pound of excess coke. One blast furnace operator is maintaining operations at his furnace by using eight or more different makes of coke, only small purchases of 10 to 25 carloads each being possible. In the furnace coke market everything tends toward strength. Some producers now are quoting $13, although sales so far have involved the maximum of $12.50, ovens. Among recent buyers have been the Shenango Furnace Co. which will blow in its second furnace this week; the A. M. Byers Co., the Struthers Furnace Co., the Sharon Steel Hoop Co. and the Pittsburgh Steel Co. Some of these with the Colonial Iron Co. still are in the market. From $12 to $12.50 is the quotable market today on 48-hour fuel with the foundry grade gaining strength being quoted up to $15. Several sales are noted at $13.50 to $14.50 which for the time being represents the quotable market, an advance of $1.50 per ton in a week. One maker with a few carloads to offer states he will not sell at less than $15, ovens. Offers of $14.50 per ton have been made on this tonnage. Sales and inquiries in connection with foundry coke usually involve two to 10 carloads but a new inquiry is current from the Steel & Tube Co. of America for 16 cars, deliveries to be made at stated intervals between Oct. 9 and next March. Although the embargo on the Pennsylvania railroad does not apply to coke shipments, they are interrupted because of a car shortage, car placement being only about 20 to 30 per cent of normal at many points in the region. Production for the week ended Sept. 23 was 105,340 tons, according to the *Connellsville Courier*, as against 99,790 tons the preceding week.

October Price $16.50

Boston, Oct. 3.—Demand for spot coke is sufficiently strong to move a round tonnage at $19.50 delivered even though the contract price continues to be $16.50 delivered. The local by-product producers have announced an October price of $16.50 delivered, and as a result requests for shipments at this figure have been heavy. Foreign coke continues to be offered at $17 to $18 delivered, and beehive coke from the Connellsville region is arriving in occasional lots at from $19 to $20 delivered.

Eastern Market Spotty

New York, Oct. 3.—Some merchants here report they are selling spot Connellsville foundry coke at $13 to $13.50, ovens. Others report that they are able to do $13.50 on so-called outside coke, but that on standard brands the prices range from $14 to $14.50. The extent to which operations are effected by the car shortage is the most important factor in determining prices. The market on furnace coke is nominal at $11 to $12, Connellsville. The Seaboard By-Products Coke Co. continues to quote $14 ovens on by-product foundry coke but is out of the market, except for requirements of regular contract users.

Decline Tonnage Offered

Cincinnati, Oct. 3.—Considerable coke tonnage has been offered this market during the past week but it is so extended that sellers have declined to make quotations, specifications in some instances being for delivery up to next April. The market has been active but sales in the main have not been large. Car shortage continues to restrict deliveries. A furnace interest in Tennessee has placed an order for 6000 tons for prompt delivery, the business going to Wise county ovens, and Ohio furnaces have closed for good tonnages. An Illinois consumer bought 600 tons for furnace consumption and a number of carload spot orders have been entered. Prices are strong, current schedules being maintained in all recent transactions. By-product ovens are reported behind on orders and are booking no new business. Indianapolis ovens this week sold 500 tons for prompt Ohio delivery on a base of $16, Connellsville.

Market Still Spotty

Birmingham, Ala., Oct. 2.—The coke market in the Birmingham district is still of the spotty character, sales being made as car supply is available. The minimum price for foundry coke is around $8.50 with $9 and $10 obtained for immediate delivery. Some contracts are being made against an improvement in the car supply. Production is steady. Local demands are being supplied right along and shipments from the territory are a little better.

Mill Shipments

Of Tin Plate Delayed by Car Shortages and Embargoes

TIN PLATE PRICES, PAGE 890

Pittsburgh, Oct. 3.—Shipments of tin plate as well as other forms of finished steel are being interrupted by the transportation situation with car shortages and embargoes furnishing the major interference. New business is low as is natural at this time of the year but occasionally a fair sized number of base boxes is bought, and several lots lately have been looked for filling-in purposes. Although the market gives every sign of going higher soon it cannot be quoted above $4.75 per base box of 100 pounds, Pittsburgh, at present. Occasionally an order is booked for export, either as tin plate or as 5-gallon oil cans.

Bar Bookings Are Heavy

Despite Deferred Deliveries Orders Continue To Be Placed—Inquiries Exceed Production—Mill Books Filled to End of Year

BAR PRICES, PAGE 890

Chicago, Oct. 3.—Inquiry for soft steel bars continues greater than producers can meet, and much tonnage is being placed on books each week in spite of the deferred delivery now offered. Bar mills are loaded to the end of the present year and in most cases far into 1923. Quotations for indefinite delivery are 2.00c to 2.10c, Chicago, mill, while for small sections for prompt delivery an independent maker has asked and received up to 2.50c, mill.

Bar iron has been advanced to a level of 2.50c, Chicago mill, by all makers, the mill quoting below this figure having withdrawn its local price. A fair aggregate inquiry from railroads is being considered, probably 1000 tons being under negotiation. Selling is sufficient to keep mills on single turn.

Rail steel bars have been advanced to a basis of 2.10c, Chicago mill, while a maker on the Mississippi river continues at 2.00c, mill. Good demand for this material is coming out in moderate lots from reinforced concrete builders and general manufacturers. Bookings about equal production.

Bookings Heavy; Deliveries Light

Pittsburgh, Oct. 3.—Bookings of merchant steel bars are heavy although deliveries still remain light. This is brought about by railroad embargoes and car shortages. Various consuming lines are noted among the list of buyers. Inquiry is heavy. Pittsburgh and Youngstown district mills are making all efforts possible to serve customers by truck but in some instances have to pile the steel. While the Carnegie Steel Co. still is understood to be maintaining a 1.90c figure to its regular customers on bars for shipment at mills' convenience, independents are obtaining 2.00c to 2.25c, the latter figure applying on small lots for immediate delivery. Refined iron remains unchanged on the basis of 2.60c, Pittsburgh. More inquiries are out and some fair sized orders have been placed during the past week or two.

Some 1.90c Sales Reported

Philadelphia, Oct. 3.—The steel bar demand is fair. Some business has been done at 2.10c to 2.15c Pittsburgh, but the largest portion has been at 2.00c. Some sales have been reported as low as 1.90c. Fourth quarter tonnage can be placed at 1.90c to 2.00c, depending upon the character of the business.

Embargo Hits Two Ways

Pittsburgh, Oct. 3.—Cold-drawn bar makers find the available supply of merchant steel bars a trifle better although deliveries to them will be greatly hampered by the embargo on all steel products inaugurated by the Pennsylvania railroad. Their shipments too are curbed although in some instances when mills are located on the Pennsylvania railroad they are making use of trucks to transport the finished bars to other roads for shipment. For the most part cold-drawn bar producers in this territory are not making fourth quarter contracts. They, however, have from two and a half to three months' business on their books and unless the delivery situation improves measurably some tonnages will be carried over into next year. The minimum market quotation is 2.50c, with as high as 2.75c appearing, particularly in connection with less-than-carload lots.

Orders Are Plentiful

Buffalo, Oct. 3.—Prices for steel bars show a range from 2.00c quoted by the Steel corporation up to 2.15c and 2.25c, base Pittsburgh, the prices made by some of the independents. Plenty of business in medium-sized lots is being placed. Several 200-ton orders have been booked.

Prices on Bolts, Nuts and Rivets Are Advanced

NUT AND BOLT PRICES, PAGE 952

Cleveland, Oct. 3.—Bolt, nut and rivet prices have been advanced by makers in this district effective Oct. 2. Bolt and nut makers are 5 to 10 per cent and rivets $3 per ton higher. Specifications for all products on third quarter contracts have been exceptionally heavy during the past few days. Contracting for fourth quarter also has been heavy. One leading bolt and nut producer states that its business in September was the largest it has ever experienced with the exception of that in March 1920. The new prices are as follows:

RIVETS

Structural rivets, Pittsburgh	3.15c
Boiler rivets, Pittsburgh	3.25c
Rivets, ⅞-inch and smaller	65 off

NUTS

(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank or tapped	$3.25 off list
Cold punched square or hexagon blank or tapped	$3.25 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts ⅞-inch and smaller	75-10-5 off
Case hardened, finished, hexagon	65-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

⅜ x 6 inches, smaller and shorter

Rolled thread	50-10-5 off
Cut thread	50 off
Larger and longer	50 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	60-5 off
Cut thread	50-10 off
Larger and longer	50-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	45 off
Larger and longer	45 off
Lag screws	60-5 off
Plow bolts Nos. 1, 2 and 3 heads	50-5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50-10 off
Rough stud bolts with nuts	45 off

Jobbers' Orders Numerous

Pittsburgh, Oct. 3.—Nut, bolt and rivet makers here report good order books from distributors and of late some pleasing tonnage has accumulated at the higher levels which apply for fourth quarter. Late in the third quarter there was considerable specifying against contracts in order to take advantage of the lower figures. The quoted discounts now are reported to be firmly held and are representative of the market. Operations are up around 80 or 85 per cent of capacity with some plants running practically full. Transportation difficulties, however, are interfering somewhat this week and that level may witness a decline.

Users Specify Fully

Chicago, Oct. 3.—Bolt buyers specified fully on their contracts for bolts and nuts during the latter part of third quarter and last week brought an unusual quantity business to makers. While much contracting for fourth quarter delivery has been done already, buying for that delivery still is going on. Prices are strong, and practically no shading is apparent. Some producers are operating plants at 85 and 90 per cent of capacity.

Demand from Warehouse Continues Heavy

WAREHOUSE PRICES, PAGE 949

New York, Oct. 3.—Trading in the local warehouse market is being well maintained. A strengthening factor is the railroad embargoes, which are causing consumers much difficulty in getting shipments from the mills, forcing them in numerous instances to turn to the jobbers for their immediate needs. The warehouses, too, are having their difficulties but in most cases they still have a fairly rounded out stock to rely upon. Prices are unchanged, the last general advance going into effect Sept. 26.

Some Prices Advanced

Philadelphia, Oct. 3.—Jobbers in iron and steel products in this district have advanced prices $2.50 a ton on several products. Demand continues on the basis of from 85 to 90 per cent of what is considered normal.

Stocks Are Low

Cleveland, Oct. 3.—Demand for iron and steel products out of warehouse continues heavy, but due to depleted stocks the volume of business is not as large as formerly. Prices are firm at the established levels. Shipments from mill are being retarded by car shortages, etc.

Spar Advanced Slightly

Pittsburgh, Oct. 3.—Quotations on domestic gravel fluorspar have gone up 50 cents per ton to a range of $17 to $18, f.o.b. Kentucky mines, on 85 per cent material with 5 per cent silicon. A few inquiries are current, including one of the Harrisburg Pipe & Pipe Bending Co. for 200 tons and of the Central Iron & Steel Co. for 100 tons. The latter is reported to have closed at under $17.50. The Pittsburgh Steel Co. has been receiving fluorspar by barge, having transported something like 700 tons. The Jones & Laughlin Steel Co. likewise is having large tonnages of this material brought in in this way. A

Buffalo steel company is having considerable foreign fluorspar delivered via the Erie canal. The new duty on the foreign material is $5.60 per gross ton.

Announce Iron and Steel Institute Program

New York, Oct. 3.—The twenty-second general meeting of the American Iron and Steel institute will be held at the Hotel Commodore, New York, Friday, Oct. 27. Two sessions of the day will be devoted to the following program:

Address of the president, Elbert H. Gary, chairman, United States Steel Corp.

Modern Methods of Mining Coal, H. Foster Bain, director, bureau of mines, Washington.

The Storage of Bituminous Coal, H. H. Stoek, professor of mining engineering, University of Illinois, Urbana, Ill., and J. V. Freeman, director, Coal and Coke Research laboratory, United States Steel Corp., Joliet, Ill.

Present Status of the Electric Furnace in Refining Iron and Steel, J. A. Mathews, president, Crucible Steel Co. of America, New York.

Economic Importance of the Power Plant in the Steel Industry, E. F. Entwisle, assistant general manager, Steelton plant, Bethlehem Steel Co., Steelton, Pa.

The Steel Requirements of the Automotive Industry, C. H. Wills, president, C. H. Wills & Co., Marysville, Mich.

Heating Furnaces for Blooms, Slabs and Billets, W. P. Chandler Jr., fuel and experimental engineer, Carnegie Steel Co., Duquesne, Pa.

Use of Liquid Fuel in Metallurgical Furnaces, R. C. Helm, director, research laboratory, American Steel & Wire Co., Worcester, Mass.

The Thermal Efficiency of the Open-Hearth Furnace, C. L. Kinney Jr., superintendent No. 1 open-hearth department, South Chicago works, Illinois Steel Co., South Chicago, Ill., and G. R. McDermott, fuel engineer, South Chicago works, Illinois Steel Co.

Fluorspar and Its Uses, G. H. Jones, president, Hillside Fluorspar Mines, Chicago.

The evening, as usual, will be dovoted to the banquet and after dinner addresses. There has been a suggestion about submitting after the banquet a tabulation of replies received to the questionnaire on the 12-hour day recently sent to members by the institute's committee on this subject. It is not certain, however, whether the committee will be able to report at that time.

Hoops Are Advanced $3

HOOP PRICES, PAGE 890

Pittsburgh, Oct. 3.—Hoops and bands are the latest among the steel products to register an advance, the price going from a minimum of 2.75c to 2.90c, base Pittsburgh, late last week. This is an increase of $3 per ton. Makers of hot-rolled strip steel in narrow sizes and thin gages are asking as high as 3.25c to 3.50c, base Pittsburgh. Demand continues comparatively light. Deliveries are much interfered with by car shortages and embargoes.

Freight Loading Gains

Washington, Oct. 3—Revenue freight loading in the week ended Sept. 23 was 97,329 cars, a gain of 30,000 over the week before, the interstate commerce commission reported today. In the same week, surplus cars totaled 11,292 as against a shortage of 107,666.

More Plate Needs in Sight

Car Buying by Railroads, Ship Work and Riveted Pipe Line Indicate Additional Demands Upon Mills—Unfilled Tonnage Heavy

PLATE PRICES, PAGE 890

Philadelphia, Oct. 3.—The plate demand is good but lacks sufficient volume to go around. Prices cover a wide range. Some tonnage is going at 2.25c and even 2.50c Pittsburgh on attractive lots. Generally 2.10c to 2.25c is done with 2.00c appearing in special instances. The independent producers in some cases are soliciting fourth quarter contracts at 2.10c.

Some Tonnage Available

Chicago, Oct. 3.—With a renewal of buying of railroad cars, additional demand on plate mills will be made for some time to come. The Inland Steel Co. can book a limited tonnage of universal plates for fourth quarter delivery, but it is difficult to obtain any considerable tonnage of plates from any western source. With 5500 railroad cars ordered from builders in the past week, about 55,000 tons of steel, largely plates, will be required. The Humble Oil & Refining Co. has placed four 80,000-barrel storage tanks with the Graver Corp. These tanks will require about 1200 tons of plates. The market on steel plates is 2.10c to 2.30c, Chicago mill.

Some Large Inquiries Appear

Pittsburgh, Oct. 3.—Occasionally a large inquiry for plates is noted, the latest one being for a miscellaneous assortment of tanks for the Gulf Refining Co. involving about 2700 tons of plates. Deliveries from the mills are greatly hampered both by the car shortage and embargoes. Unfilled orders on the books of steel makers are heavy in all cases and specifications against contracts would be forthcoming if satisfactory deliveries could be made. A small lot of penstock work was let this week and occasionally a small tank job is noted requiring between 100 and 500 tons of plates while boat and barge work calls for specifications against plate contracts from time to time. The market still is quoted at 2.00c to 2.25c, base Pittsburgh.

Another Freighter Proposed

Cleveland, Oct. 3.—New propositions for vessel construction for the lakes continue to appear. Another freighter requiring 3000 to 4000 tons is up for figures, but a similar undertaking which has been pending for some time now has practically been abandoned. On a pipe line extension for the city waterworks involving about 1500 tons of steel, the Peter Conley Construction Co. is low bidder on a lock bar design and J. L. Martin is low on both the alternatives of cast iron pipe or riveted pipe construction. An award is expected this week. Plate prices are steady at a range of 2.00c to 2.25c with a fair volume of miscellaneous new business.

Basing Point Up Nov. 1

Washington, Oct. 3.—Hearings on the Pittsburgh basing point complaint will be resumed in Washington Nov. 1. The federal trade commission expects to conclude its case within the subsequent two weeks. The United States Steel Corp. then will begin the presentation of its defense, probably at Pittsburgh.

Brier Hill Steel Plans Additional Mills

Youngstown, O., Oct. 2.—Building of one strip mill and two lapweld tube mills will be started by the Brier Hill Steel Co., as soon as engineering plans are completed James B. Kennedy, chairman of the board of directors has announced. This announcement came after a plan to form a merger between the Brier Hill company and the Youngstown Sheet & Tube Co. had been abandoned.

About $5,000,000 will be spent on the new finishing capacity which was designed to take care, together with the two plate mills and 28 sheet mills of the 700,000 tons of steel ingot capacity of the company. An additional $1,000,000 will be spent on the modernizing of the 12 sheet mill unit Thomas plant at Niles.

Money for the improvement will be furnished from the proceeds of the sale of a $10,000,000 bond issue, which has been sold to the Guaranty Co. of New York, Mr. Kennedy announced. The bond issue will be secured by a first mortgage maturing in 20 years at interest of 5½ per cent, with an annual sinking fund of $300,000 starting Oct. 1, 1924. The balance of the purchase price of the bonds will be added to the working capital.

Ore Shipments Fair

ORE PRICES, PAGE 952

Cleveland, Oct. 3.—Shipments of Lake Superior ore in September amount to 6,801,299 tons, bringing the total for the season to date to 33,111,238 tons. This indicates about a 40,000,000-ton movement. Shipments in September, 1921, were 3,913,122 tons, and for the 1921 season up to Oct. 1, 18,661,194 tons. The seamen's strike on the lakes inaugurated this week has had no effect upon the operation of vessels and the movement of ore. As far as is learned not a single vessel has been laid up for this cause and the boats are getting away with the usual dispatch as the operators have met with no great difficulty in recruiting men of the type needed to fill out the crews. The ore market has developed no points of interest in the past week.

Advances Boiler Tubes

Pittsburgh, Oct. 3.—The Parkersburg Iron & Steel Co., Parkersburg, W. Va., has advanced boiler tubes from 5 to 13 points effective until further notice. The 1¼-inch size now is list plus 11; 1¾-inch, list plus 1; 2 and 2¼-inch, 9 off; 2½ to 3-inch, 14 off; and 3¼ to 4½-inch, 16 off. These are for less than carload shipments.

Steel Scrap in Demand

Heavy Melting Grade Brings as High as $22—Rail Embargoes Curtail Shipments—Railroad Offerings in Larger Tonnage

SCRAP PRICES, PAGE 956

Chicago, Oct. 3.—Considerable more interest is noted in the scrap market and activity by dealers has been a feature during the past few days. On a recent large offering by the Illinois Central railroad, prices considerably above present quotations were bid and dealers competed strongly for the tonnage. Consumers are willing to buy, but are not entering the market. Steel scrap is in demand under these circumstances and the leading steelmaker bought a considerable tonnage during the past few days. Malleable scrap is active but rolling mill and gray iron grades are quiet. The greatest difficulty in the scrap market comes from lack of cars and it is difficult to make shipments. With the exception of the list closed Sept. 30 by the Illinois Central, which carried 8000 tons, no important offering is being made by the railroads. The Michigan Central and the Erie have asked bids on open lists.

Cast Scrap in Demand

Boston, Oct. 3.—Demand from New England foundries for both No. 1 and No. 2 cast scrap is strong and several thousand tons have changed hands during the past week. In addition, some steelworks such as the American Steel & Wire Co., Worcester, Mass., and the Tremont Nail Co., Wareham, Mass., are in the market for No. 2 cast. One dealer reports sales aggregating 600 tons of No. 2 cast within the past week at prices ranging close to $21 delivered. This is exceptionally high for this grade in the face of $22 delivered for textile castings which can still be done. Borings and turnings have advanced sharply during the last few days to $12 dealers' yards, and demand is active. The sentiment throughout the market is bullish and small dealers are storing rather than selling.

Outsiders Are Buying

Buffalo, Oct. 3.—Strength of outside demand is taking considerable scrap tonnage out of this district. Youngstown is paying $23 to $23.50 for heavy melting steel while the highest the local consumers will offer is $18.50 to $19.50. Dealers are selling out of town and stocks are beginning to weaken. With the railroad lists coming out next week, it is probable they will command the highest prices in years. Every article on the list is strong. Demand for turnings from outside the district is strong. Production is light.

Sells Old Rails

St. Louis, Oct. 2.—The principal scrap sale of the week was 3000 tons of old street car rails by the United Railways Co., the offering being quickly taken up by dealers at fancy prices. Little material is coming in, although the first railroad list of consequence to be offered for some time is now before the trade. This is from the Pennsylvania and comprises about 3800 tons. The Burlington also issued a list during the week, but withdrew it. Rolling mill grades, such as couplers, knuckles, springs and car wheels are in good demand, while melting steel is a bit easier, but there is little pressure on the market.

Rising Tendency Checked

Pittsburgh, Oct. 3.—Scrap sellers are giving the increasing pig iron production figures considerable attention and apparently the rising tendency of scrap prices is somewhat checked. Several consumers in the Pittsburgh territory already are refusing to purchase at the quoted levels. Recent sales of steel specialties, however, have been booked at as high as $24 and $24.50, and heavy melting steel has sold in fair sized tonnage at $22. One buyer was able to close on heavy melting steel at $20 and a large independent steel company here still offers $17.50, having 10 blast furnaces now in, with prospects of more going under blast at an early date. During the past week higher levels were introduced by sales of a few grades and bids on the railroad lists which close today and the remaining part of the week are ex-

(Concluded on Page 909)

Sheet Bars Carried Over

Large Undelivered Tonnages Taking Up Fourth Quarter Output—Wire Rod Demand Exceeds Production—Prices Steady

SEMIFINISHED STEEL PRICES, PAGE 890

Pittsburgh, Oct. 3.—In numerous instances large tonnages of semifinished material, particularly sheet bars, are being carried over into the fourth quarter. In the case of the Carnegie Steel Co. it is understood that the carryover is sufficiently large to preclude any further bookings for fourth quarter delivery. The going market on sheet bars, billets and slabs is $40. While as high as $45 is being quoted in some directions, the $40 figure represents the market price since several valley makers have obligated their entire production on that basis, f.o.b. Youngstown. One large independent steel company here has been quoting open-hearth sheet bars at $42, Pittsburgh, maintaining the $40 level on bessemer sheet bars. This is understood to be purely an individual condition since this company needed open-hearth steel in other departments.

One interest reports that it is figuring on about 25,000 tons monthly of semifinished business for the fourth quarter from its regular customers in this vicinity, but not many formal inquiries are current since so much tonnage is on the books which could not be shipped in the third quarter. Among those companies carrying over large tonnages of sheet bars is the Cambria Steel Co. which will start Oct. 15 to make delivery on material due during the past three months.

But few inquiries for billets, slabs, etc., are out. Little interest is being manifested in price and more concern being felt over deliveries. Several consumers of forging billets here state they cannot book their requirements under $50 and that is the quotable market with practically only one source of supply available. A few orders were booked on that basis this week. One inquiry is current, understood to be from the Universal Steel Co., Bridgeville, Pa., for 4000 tons of high carbon slabs.

Wire rods are quoted at $45 to $47.50, with only small lots available at the latter figure in the open market. Skelp is quoted all the way from 2.00c to 2.50c, base Pittsburgh. No new inquiries are noted and bookings are somewhat limited except in the case of the suppliers of such consumers as Spang-Chalfant Co., the Central Tube Co., and others.

Bar Settlement at $40

Cleveland, Oct. 3.—Current sheet bar prices now have been definitely settled at $40 Pittsburgh and Youngstown. A leading producer in this territory has fixed $40 as its price for October delivery to regular customers. Some additional tonnage also has been sold at that price. A tonnage of billets also has been sold at the same figure. A local automobile manufacturer is in the market for 1150 tons of 2 x 2-inch and 4 x 4-inch forging billets for delivery over the remainder of the year.

Sale Are Lacking

Youngstown, O., Oct. 3.—Sales of semifinished material in this district are lacking. Consumers of sheet bars covered on their fourth quarter requirements recently at $40, Youngstown, and since then makers cannot see the way clear to increase commitments in view of no surplus steel. Billets and slabs are quoted $40, Youngstown, although no valley producer is in a position to consider tonnage in this direction. No inquiry for any grade of semifinished material is before producers here.

Wire Rods in Demand

New York, Oct. 3.—Most of the business in semifinished steel here involves wire rods. The supply of rods continues unequal to the demand. Therefore, the important question in the rod market is delivery more than price. Most mills are refraining from taking full advantage of the situation, and the bulk of the current business is going at $45 to $47.50, base Pittsburgh. In some instances rod transactions have been put through at $50.

The billet market here is not thoroughly tested due to the fact that demand is quiet. Open-hearth rerolling billets are $40 to $41 base Pittsburgh.

and forging billets $45 to $48. Sheet bars are nominal at $40 to $41 base Pittsburgh.

Strip Steel Advances

STRIP PRICES, PAGE 890

Pittsburgh, Oct. 3.—Advances of $3 and $5 per ton, respectively, on hot and cold-rolled strip steel were inaugurated by leading makers here on Sept. 28. This makes the new prices 2.90c and 4.50c, base Pittsburgh, respectively. Recent bookings have been heavy and practically no letup is noted in connection with automotive business, notwithstanding the fact that strip buying by such interests usually is past by this time. Other consuming lines, too, are active, several round tonnages having been placed recently. The aggregate tonnage on the books of makers is evenly divided between hot and cold-rolled, although orders for hot are perhaps more numerous.

At the present time the Pennsylvania railroad's embargo against steel shipments is greatly interfering with operations and deliveries. The latter are practically nil except by truck and operations are steadily on the down grade. On the narrow sizes of hot-rolled strip steel, 3.25c to 3.50c is being quoted and one producer of cold-rolled is quoting 4.75c, base Pittsburgh. The regular market, however, is 2.90c and 4.50c, respectively, on hot and cold-rolled strips.

Manganese Ore Nominal

New York, Oct. 3.—The manganese ore market continues to be quoted at 29 to 29½ cents per unit at tidewater, plus the duty, but this level is nominal in the absence of sales. One cargo for spot arrival is wanted but does not seem to be obtainable.

Beats Manganese Duty

Birmingham, Ala., Oct. 2.—The Tennessee Coal, Iron & Railroad Co. has on the way up the Warrior river another cargo of manganese ore from Brazil, 7200 tons being in this consignment. The British steamer WESTRA brought the ore to Mobile several days ago and succeeded in entering through the custom house there just a few minutes before the deadline which placed a duty of $12 per ton of manganese ore. This was a saving of more than $86,00.

Will Barge Steel

The Wheeling Steel & Iron Co. subsidiary of the Wheeling Steel Corp., has purchased the large Ohio river towboat TRANSPORTER, from the Water Transport Co., Pittsburgh. The TRANSPORTER, recently completely rebuilt, is 180 feet long with a 36-foot beam. It is the intention of the Wheeling company to use the vessel in the transportation of iron and steel products from the Wheeling district to Cincinnat, Louisville, Evansville, Memphis, Vicksburg, and New Orleans. It is reported that the Wheeling Steel & Iron Co. has made an arrangement with the liberty Transit Co. by which the latter will be in charge of the navigation of the TRANSPORTER.

Sheet Deliveries Held Up

Car Shortage Hinders Shipments and Material Accumulates at Mills—Operations Are Being Curtailed—Demand Still Is Heavy

SHEET PRICES, PAGE 890

Youngstown, O., Oct. 3.—Accumulation of sheets on warehouse floors of certain Mahoning valley makers, due to the inability of railroads to supply sufficient carriers, approximated 20,000 tons at the beginning of this week. The car supply in certain parts of the valley is from 15 to 20 per cent of normal. As a result of congestion, sheets mill operation has been curtailed from 98 to 91 per cent of capacity, a loss of eight mills.

A slight lull is noticed in the volume of business placed recently although most sheetmakers here have specifications for 30 days ahead. One producer in the upper part of the valley has withdrawn from the market temporarily on all grades while another maker will not consider galvanized business. On desirable specifications one producer here accepted tonnage at 4.50c, Pittsburgh, on galvanized recently although its asking price now is 4.60c which appears the market on this grade. Some producers have quoted galvanized at 4.65c and as high as 4.75c, Pittsburgh, although as far as can be learned no business developed. Black is quotable at 3.50c by the majority of producers. One mill states its price on this grade now is 3.75c. Automobile sheets are commanding 5.00c, Pittsburgh, for 22 gage, producers reporting a good assortment of business up for negotiation. While confirmation is lacking, reports are current to the effect the standard extra of 40 cents per 100 pounds, which applies on stock single pickled, cold-rolled and annealed, has been increased to 60 cents while the extra of 60 cents for full pickled, full cold-rolled and reannealed has been advanced to 80 cents per 100 pounds.

Demand Is Brisk

Buffalo, Oct. 3.—Sheet demand is brisk, principally for black. The price for the latter is firm at 3.50c, base Pittsburgh. A labor shortage prevents capacity operations at local mills. Some galvanized business has been taken at 4.50c but the going price is 4.35c, base Pittsburgh.

Inbound Steel Practically Nil

Pittsburgh, Oct. 3.—Sheet mills have heavy order books but are unable to make deliveries because of the order of the interstate commerce commission to use open top cars only for the transportation of coal; hence, inbound steel tonnages are practically nil. Sheet bars 30 feet long cannot be trucked nor transported in side door box cars and flat cars are practically obsolete. To cut the sheet bars for trucking purposes introduces loss through waste. This week a new factor is introduced in the embargo order of the Pennsylvania railroad against all steel shipments. Some trucking is being done, particularly to receiving platforms of other railroads, but sheet mill operations gradually are being interfered with. Some mills lost 10 to 15 per cent last week from levels in advance of 70 per cent the preceding week.

Railroads and car builders are not slow to ask mills for increased tonnages of sheets for car construction, car repairs, etc. Numerous open top cars are on sidings between the coal fields and lake as well as ocean ports, or waiting to be unloaded at those points. It is estimated 12 days' supply is on hand at lake ports alone for the unloading facilities there, and 10 days' supply on the way, thus tying up many thousands of cars. Sheet consumers in several cases are accepting the inevitable and are shutting down or are curtailing operations. From time to time efforts to purchase 2000 or 3000 tons of various grades are made but most mills are carrying large tonnages over into the fourth quarter and with recent heavy bookings are unable to name attractive delivery dates. While the American Sheet & Tin Plate Co.'s prices are 2.50c, 3.35c, 4.35c and 4.70c, base Pittsburgh, on blue annealed, black, galvanized, and full-fiinished 23-gage automobile sheets, these levels cannot be considered open market quotations since that interest is practically out of the market. If it could get the steel and the cars it could operate at 90 per cent the remainder of the year. The open market quotation on black sheets appears to be 3.50c although up to 3.75c also is noted. More sales of galvanized at 4.75c are reported than black at the maximum of 3.75c, there being less opportunity for the booking of galvanized orders. As high as 5.00c is openly quoted by independents on full-finished automobile sheets and 5.25c is their price on hood and fender stock. Blue annealed sheets now are quoted as high as 2.85c although 2.60c and 2.65c likewise continue to appear in the open market against the American company's figure of 2.50c.

Deliveries Are Delayed

Chicago, Oct. 3.—With the principal producer and the independent sheet mill both sold for practically their full production over the remainder of the year, users find it practically impossible to place further business, especially for fourth quarter delivery.

Prices Are Firmer

Philadelphia, Oct. 3.—Sheet prices are hardening. Blue annealed sold in the past week at 2.60c Pittsburgh. It is now difficult to buy under 2.75c. Galvanized is 4.75c Pittsburgh as a rule but 4.50c has not disappeared. A price of 3.75c is asked for black in some quarters but it is unnecessary to pay more than 3.50c. It is reported 3.50c has been shaded on some tonnage in the past week. The leading factor for strength in sheets appears to be the difficulties to make shipments, due to the car shortage particularly in the Youngstown district. Sheet buying is not active but is steady. A leading inquiry is from the Norfolk & Western which wants a big tonnage.

Book Record Rail Tonnage

Mills Accept 1,500,000 Tons as Railroads Anticipate Price Advance—Heavy Buying of Track Material—Car Purchases Active

RAILROAD TRACK MATERIAL PRICES, PAGE 890

New York, Oct. 3.—Total sales of rails during the past few days to railroads which buy in the New York and Philadelphia districts have aggregated at least 650,000 tons, it is estimated. This total allows for some tonnage on which an agreement has been reached, but which has not actually been signed up. The total may be swelled within the next few days by some tonnage on which the $40 base price is good but on which action has been held up for one reason or another. The biggest buyer is the New York Central, which has taken 194,300 tons, involving practically its full requirements for the year 1923. This business was allotted as follows: Illinois Steel Co., 74,500 tons; Carnegie Steel Co., 16,464 tons; Bethlehem Steel Co., 85,036 tons; Inland Steel Co., 15,800 tons; and Cambria Steel Co., 2500 tons. The Pennsylvania railroad has placed 170,000 tons also, practically its full requirements for 1923. Of the total, 8000 tons will go to the Long Island railroad, a subsidiary of the Pennsylvania. The Pennsylvania business was distributed as follows: United States Steel Corp., 78,000 tons; Cambria Steel Co., 37,000 tons; Bethlehem Steel Co., 46,000 tons; and Inland Steel Co., 9000 tons. Other roads which have bought lots ranging from 35,000 tons downward, are the Erie, Atlantic Coast Line, Florida East Coast, Lehigh Valley, Central Railroad of New Jersey, Virginian, Southern Pacific, Delaware, Lackawanna & Western, Delaware & Hudson, Carolina, Clinchfield & Ohio, and Philadelphia & Reading.

A tremendous business is being done in tie plates and other track accessories. The New York Central has distributed some large orders in this connection. The New York, New Haven & Hartford railroad is inquiring for 2,000,000 tie plates and the Boston & Maine for 1,000,000. The Baltimore & Ohio and Norfolk & Western have large tie plate inquiries out. The New York, Ontario & Western, the Seaboard Air Line and the Richmond, Fredericksburg & Potomac will also inquire for smaller quantities of tie plates.

Little new car inquiry developed in this district during the past week; at the same time, orders have been relatively light. Locomotive demand has also fallen off somewhat.

Several Carloads Booked Daily

Pittsburgh, Oct. 3.—From five to 10 carloads of light rails are placed in this section from day to day at the ruling figure, 2.25c, base Pittsburgh. Bids closed Sept. 29 on a fair tonnage of 70-pound rails and fittings for the Alaskian Engineering commission, Seattle, Wash. Standard rail bookings from various railroads were heavy during the latter part of September and this has been accompanied by unusually large inquiries for spikes, tie plates and other track accessories. It is less easy to bring these to the closing point than rails, however, and many still are pending. Standard spikes are quoted at 2.85c; small spikes at 3.50; tie plates at 2.25c to 2.50c, and track bolts at 3.85c to 4.50c, all base Pittsburgh.

Place Rail Tonnages

St. Louis, Oct. 2.—Purchases of rails by lines centering in St. Louis amounted to 43,000 tons during the last two weeks as follows: Missouri, Kansas & Texas, 10,000 tons; Missouri Pacific, 15,000 tons; Wabash, 15,000 tons; and Terminal Railway association, 3000 tons, all being 90-pound rails with the exception of the latter, which were 100-pound. The St. Louis Southwestern has had undelivered 5000 tons purchased in 1920 and 10,000 tons purchased in 1921. Its further requirements of about 5000 tons will be taken up after Oct. 3. The Missouri, Kansas & Texas wants 3000 tons of high carbon, hot worked steel tie plates, 2000 kegs of track bolts and 4500 kegs of track spikes. The Missouri Pacific wants 3000 tons of tie plates.

Biggest Buying of Rails

Chicago, Oct. 3.—With the price of standard steel rails advancing over Sunday from $40 to $43 per ton, railroads hastened during the past few days to place their contracts for first half. When books closed Saturday, it was found practically every railroad of any standing entering Chicago had bought an important tonnage. The total covered by these orders runs close to 750,000 tons, the larger portion going to the Gary and South Chicago mills, while about 200,000 tons will be rolled at Indiana Harbor. Probably never before has an equal tonnage of rails been placed in an equally short period as has been the case between the time of announcement by the United States Steel Corp. and the closing of books at the end of September. The largest previous selling under such circumstances as remembered by older salesmen was about 350,000 tons, which is about half the present tonnage. One of the last orders to be placed was 195,000 tons by the New York Central of which the Illinois Steel Co. took 75,000 tons, Bethlehem and Lackawanna 85,000 tons, Inland Steel Co. 18,000 tons, and the remainder went to eastern mills.

With this heavy selling of rails, some unusual sales of track fastenings were made. Not only were angle bars, tie plates, spikes and bolts for the new rails covered at this time, but some additional lots were also bought for repairs. The selling of track fastenings has aggregated close to 150,000 tons, several orders for 30,000 kegs of spikes having been entered.

Car buying continues, orders for about 5500 cars being placed during the past week, the leading items being 1500 for the Santa Fe, 1000 for Chicago & Great Western and 2000 for the Atlantic Coast Line.

Place 85,000 Tons

Philadelphia, Oct. 3.—To the total of rail tonnages reported placed in other markets may be added 85,000 tons representing purchases here by the Baltimore & Ohio, the Norfolk & Western, the Chesapeake & Ohio and the Hocking Valley railroads. Eastern railroads are placing large tonnages of track accessories. The Seaboard Airline is inquiring for 1000 kegs of spikes. The Baldwin Locomotive Works has booked 59 locomotives for the Santa Fe.

Ohio Railroads Place Tonnage

Cleveland, Oct. 3.—Orders for approximately 45,000 tons of rails for 1922 delivery have been placed in this district principally by the railroads, the past week. The Nickel Plate closed for 19,000 tons which include the requirements of the Lake Erie & Western, the major portion of which went to Steel corporation mills and the remainder to the Bethlehem Steel Co. and the Inland Steel Co. The Toledo, St. Louis & Western placed 8000 tons with the Carnegie Steel Co. and 1000 tons with the Cambria Steel Co.; the Ann Arbor 3000 tons with the Cambria Steel Co.; the Northern Ohio Traction & Light Co. 800 tons with the Carnegie Steel Co. and a frog and crossing manufacturer 1500 tons divided between the Carnegie Steel Co. and the Cambria Steel Co. An order for 500 tons for an industrial company also was closed.

CAR ORDERS PLACED

Atlantic Coast line, 2000 box, to Standard Tank Car Co.
New York Central, 200 stock repairs, to Streator Car Co.
West Penn Power Co., Pittsburgh, 60 hoppers, to American Car & Foundry Co.
Grand Trunk, 250 refrigerators, to American Car & Foundry Co.
Richmond, Fredericksburg & Potomac, 10 coaches, to Bethlehem Shipbuilding Corp.
Chicago Great Western, 1000 cars to Pullman Co.
New York, Chicago & St. Louis, 300 steel underframes to the Illinois Car & Mfg. Co.
Chicago, Indiana & Western, 300 hoppers to American Car & Foundry Co.
Santa Fe, 1000 refrigerators and 500 stock to Pullman Co.
The New Orleans-Great Northern, 200 freight to Southern Car Co.
Chicago & Alton railroad, repairs on 200 steel gondolas, each to Illinois Car & Mfg. Co. and Mt. Vernon Car Mfg. Co.
Hocking Valley, 1000 gondola repairs, divided between Pressed Steel Car Co. and Greenville Car Co.

CAR ORDERS PENDING

Chicago & Northwestern, 800 gondola and 200 freight, bids asked.
Grand Trunk, 2000 automobile, 4000 box and 700 refrigerator, bids asked.
New York, Ontario & Western, 100 box cars, bids asked.
Indian State Railways, repairs to 3130 miscellaneous cars, bids asked.

American Steel Foundries Raises Castings List

A new schedule of steel castings prices carrying advances of from 15 to 20 per cent have been put in effect by the American Steel Foundries. The new list supersedes the prices and discounts which have prevailed under the schedule issued July 1. The advances have been fixed in accordance with the higher prices prevailing on raw materials enter-

ing into the production of steel castings, including bessemer and basic pig iron, heavy melting steel scrap, ferroalloys, coal, etc. Various modifications have been made in the arrangement of the list as originally prepared tending to better classify the different weights of castings particularly those of less than 10-pound weight. The list is divided into seven sections: A covering castings for freight cars, mine and industrial cars and small castings ordered in quantities of from 1 to not more than 500 pieces of one pattern at a time; B covering rolls and mill pinions for rolling mills; C covering locomotive frames; D covering wheel centers for locomotives; E covering miscellaneous castings for locomotives; F covering miscellaneous castings of similar design; and G all other miscellaneous castings. No change is made by the new list in the schedule of extras.

Wire Orders

Continue Heavy — Demand Exceeds Placements—Operations May Fall

WIRE PRICES, PAGE 890

Pittsburgh, Oct. 3.—Although the Cambria Steel Co. continues to name levels $1 per ton above the market prices on wire and wire products maintained by practically all other producers, its bookings are said to be fairly heavy. Other makers, including the American Steel & Wire Co., are naming 2.45c and 2.70c, base Pittsburgh, on plain wire and wire nails, respectively, with prices on other products in harmony therewith. Unfilled orders are heavy and while a slight letup in new bookings is noted, a fair aggregate tonnage is placed each week.

Advance Drives in Business

Chicago, Oct. 3.—Quotations on wire and nails equalized by an increase of $2 per ton by the leading maker have caused users to specify fully against their third quarter contracts and little tonnage has been left open. Demand for new tonnage is heavy, but mills are unable to book as much as is offered, because of the limited production and difficulty in obtaining cars for shipment. As a result only part of the new business is being booked. While prices are firm and steady, it is believed premiums are asked occasionally by some makers for prompt material. Somewhat better conditions exist as to production, but mills still have much to do in getting back to normal. The market at present is quoted at 2.45c, Pittsburgh, for wire and 2.70c, Pittsburgh, for nails.

Welding Society Meets

Chicago, Oct. 3.—The American Welding society at its fall meeting this week received the report of the committee on specifications of steel to be welded and discussed the properties of cast iron as to weldability and three methods of welding cast iron, gas, thermit and electric. About 30 members were present. The Wednesday and Thursday sessions are to be held jointly with the American Electric Railway Engineering association. Subjects for discussion are needs for research, problems of welded rail joints and application to various work.

Shape Bookings Recover

More Activity Reported in Structural Market but Advanced Season Indicates Let Up in Demand—Some Sizable Projects Still Pending

STRUCTURAL SHAPE PRICES, PAGE 890

New York, Oct. 3.—The advance of the building season is reflected by another week of relatively small business in the structural market. Only a few sizable orders have been placed, and aside from of a lot of 5000 tons for a coal pier at Norfolk, Va., little new inquiry of importance is noted. It is believed likely there will be no outstanding buying now for the next few weeks, or until builders begin to figure on their spring requirements. The structural shape market continues at 2.00c to 2.10c, Pittsburgh, with premiums on nearby deliveries. Generally, the deliveries now offered range around 10 to 12 weeks.

Car Shortage Feared

Boston, Oct. 3.—Increasing anxiety over delivery of structural steel to New England during the winter months is having the effect of bringing a large amount of miscellaneous tonnage into the market. Individual jobs are nearly all small, but prices are firm at 2.10c to 2.25c, Pittsburgh, and demand is strong.

Structural Tonnage Light

Chicago, Oct. 3.—Although a considerable number of structural projects have been closed in the West during the past week, with two exceptions they were for small tonnages. The activity of this market is expected to be considerably less from now on as the open building season shortens and as fabricators find it increasingly difficult to make shipments. Plain material is quoted at 2.10c, Chicago mill, by the principal producer and at 2.20c, Chicago mill, by an independent maker.

Specifications Are Received

Pittsburgh, Oct. 3.—The latter part of September was characterized by heavy specifications filed with the shape mills on beam and channel contracts since the time for their placing expired Sept. 30. This week deliveries are more than ever curtailed by the embargo inaugurated by the Pennsylvania railroad. Only one job of size is reported among the awards, that of the Weirton Steel Co.'s new plant, 1600 tons. Few projects of size are coming up locally. While the market still is quoted at 2.00c to 2.25c, the bulk of the business is going on the 2.00c basis, higher figures applying where prompt deliveries of small lots are required.

Projects Are Fewer

Philadelphia, Oct. 3.—The shape demand is smaller due to contraction in the number of structural projects. Most of the current plain shape business is going at 2.00c Pittsburgh, some at 2.10c and some special business under 2.00c.

Sizable Jobs Pending

Cleveland, Oct. 3.—Scarcity of building projects reflects the waning of the structural season. Extension of time for bids to Oct. 16 holds interest in the 1700 to 2500 tons required for a department store addition here. The size of the job depends upon the range of three to seven floors contemplated. Revival of the Commodore Perry hotel project at Akron also is of interest. Fabricators are figuring on a 5000-ton inquiry revived for the Pennsylvania railroad's Altoona shops. Prices on plain material range around 2.00c, Pittsburgh.

CONTRACTS PLACED

Awards reported this week	**9,739 tons**
Awards reported last week	**3,339 tons**
Awards reported two weeks ago	**29,757 tons**

1600 tons, building for Weirton Steel Co., Weirton, W. Va., to McClintic-Marshall Co.
1032 tons for Chicago Trust building, Monroe and Clark streets, Chicago, to Duffin Iron Works.
900 tons, addition to power plant of Edison Electric Light Co., South Boston, Mass., to Levering & Garrigues.
800 tons, school No. 192, New York City, to A. E. Norton Inc.
800 tons, school No. 193, New York City, to A. E. Norton Inc.
730 tons, for Corn Products Co., Pekin, Ill., to Vierling Steel Works.
600 tons, South Side high school, St. Louis, to Spuck Iron & Foundry Co.
400 tons, parochial school, Brooklyn, to A. E. Norton, Inc.
318 tons, building for Illinois Publishing & Printing Co., Chicago, to Morava Construction Co.
300 tons, additional steel for Jones Island sewage disposal plant at Milwaukee, to Milwaukee Bridge Co.
300 tons, Lyons warehouse, San Francisco, to Western Iron Works.
300 tons, bridge for Virginian railroad, to Virginia Bridge & Iron Works.
247 tons for McDougal Warehouse, Duluth, S. Scott Joy, architect, to Minneapolis Steel & Machine Co.
235 tons, extension of mills of Appleton Coated Paper Co., Appleton, Wis., to Milwaukee Structural Steel Co.
200 tons, two schools in West Virginia, to Memphis Steel Construction Co.
200 tons, small miscellaneous work, to Pittsburgh Bridge & Iron Works.
177 tons, bridge for Illinois Central railroad over Tradeover river, Sturgis, Ky., to American Bridge Co.
150 tons, for tanks and towers, for West Penn Power Co., to Memphis Steel Construction Co.
150 tons for Johnstown Terminal Warehouse, Johnstown, Pa., to Memphis Steel Construction Co.
100 tons, addition to Women's Athletic club, Sutter street, San Francisco, to Judson Mfg. Co.
Tonnage not stated, foundry for Consolidated Machine Tool Corp., Wilmington, Del., to Shoemaker-Satterthwait Bridge Co.

CONTRACTS PENDING

5000 tons, coal pier for Virginian railroad, Norfolk, Va., pending.
5000 tons, shops for Pennsylvania railroad, Altoona, Pa., reported revived.
2270 tons, bridge over Cerritos channel, Los Angeles, bids in.
1700 to 2500 tons, addition to store, Halle Bros. Co., Cleveland, bids extended to Oct. 16.
1200 tons, Commodore Perry hotel, Akron, O., revived.
1000 tons, apartment house, Fifth avenue and Ninety-eighth street, New York, bids asked.
1000 tons, apartment house, Sixty-seventh street and Lexington avenue, New York, revived.
700 tons, building for Phoenix Portland Cement Co., Birmingham, Ala., bids asked.
213 tons for clinker storage, Superior Portland Cement Co., Concrete, Wash., bids being taken.
178 tons for deck plate girder spans for Illinois Central railroad, Paducah, Ky., bids asked.
175 tons, building for Harold Furniture Co., Reading, Pa., bids asked.
150 tons, building for Moose lodge, Market street near Twelfth street, San Francisco, bids being taken.
110 tons for Civic Center building, Bartlesville, Okla., bids asked.
105 tons, fullers earth building for Sinclair Refining Co., Olmstead, Ill., bids asked.

Reinforcing Bars Active

While Week's Bookings Include Lot of 2500 Tons, Awards Now Generally Small Tonnages—Car Shortage and Embargoes Hinder

REINFORCING BAR PRICES, PAGE 890

Chicago, Oct. 3.—Purchases of reinforcing bars for concrete construction continue to be made in gratifying tonnage and so much business is pending in this line that sellers will have all they can handle through the fall and winter. While most of the tonnage comes in lots under 100 tons, which are preferred by sellers, a considerable number are much over that size. The largest tonnage placed in the West involves 1300 tons for a filtration plant at Bay City, Mich., which was taken by the Paul J. Kalman Co. The market continues firm at 2.50c, Chicago warehouse.

Slow To Book Tonnage

Buffalo, Oct. 3.—Car shortage is holding up shipments of reinforcing bars. Inquiries are good but makers are going slow on taking tonnage. Lots are running up to 200 tons with 2.00c to 2.25c now being quoted. The going price is 2.10c base Pittsburgh.

Pending Tonnage Fair

Pittsburgh, Oct. 3.—Almost 2000 tons of reinforcing concrete bars are involved in jobs which are before fabricators here. This includes 700 to 1500 tons which will probably be bought this week for the Schenley apartments, as well as several other jobs from 135 to 175 tons each. Railroad embargoes, particularly the one of the Pennsylvania, against all steel shipments this week, is interfering with loadings also. Another railroad order precludes the shipment of double cars so that 45-foot bars cannot be delivered for the time being. Prices remain the same, from 2.00c to 2.25c being representative of the market range.

Small Lots Numerous

Cleveland, Oct. 3.—Mostly small lots are involved in the concrete bar tonnages placed here in the past week. By far the larger part of the business being done is on contracts requiring less than 100 tons, the greatest number being under 50 tons. The Windermere Transfer & Moving Co.'s warehouse, 110 tons, was the only award of size during the week while to the new inquiries were added 160 tons for a power house addition for the Ohio Public Service Co. at Lorain and revival of the proposed Commodore Perry hotel at Akron, calling for 800 tons. Prices on reinforcing bars now quoted range from 2.00c to 2.10c, Pittsburgh.

Would Postpone Action

New York, Oct. 3.—While a good many concrete projects are mentioned here, there is a general dispostion to postpone action. As a result, lettings have decreased considerably of late and active projects in sight are few. Prices continue to range from 2.00c to 2.25c, base Pittsburgh, depending upon the delivery. Bars for shipment out of warehouse continue to bring prices around 2.50c, base Pittsburgh.

CONTRACTS PLACED

Awards reported this week.....	10,290 tons
Awards reported last week.....	6,353 tons
Awards reported two weeks ago....	2,750 tons

2500 tons for Conners Creek sewer, Detroit, to Carnegie Steel Co.
1500 tons, building for Union Electric Light & Power Co., East St. Louis, to Paul J. Kalman Co.
1300 tons, filtration plant, Bay City, Mich., to Paul J. Kalman Co.
900 tons, Meyer Bank building, Portland, Oreg., to Truscon Steel Co.
800 tons, subway work, Boston, to Barker Steel Co.
500 tons, South Side high school, St. Louis, to Reinforced Concrete Co.
325 tons, power plant for Grand Tower Power Co., Grand Tower, Ill., to Corrugated Bar Co.
300 tons, Commodore apartments, Des Moines, Iowa, to Concrete Steel Co.
280 tons, Keenan hotel, Fort Wayne, Ind., to Concrete Steel Co.
250 tons, state printing office, Sacramento, Cal., to W. S. Wetenhall & Co.
250 tons, Shrine temple, Tulsa, Okla., to Paul J. Kalman Co.
200 tons, miscellaneous work in Ohio and Pennsylvania, to Concrete Steel Co.
200 tons, highway work in Illinois, to Paul J. Kalman Co.
150 tons, paving work near Little Ferry, N. J., to Truscon Steel Co.
125 tons, school, Albany, N. Y., to Hartmann, Duncan & Rogow, Inc.
110 tons, warehouse for Windermere Transfer & Moving Co., Cleveland, to Patterson-Leitch Co.
100 tons, Rolater warehouse, Oklahoma City, Okla., to Capitol Steel & Iron Co.; general contractor Paschall Bottoms.
100 tons for Oak Park club house, Oak Park, Ill., to the Barton Spiderweb System, Chicago.
100 tons for Cash Quality Stores Co., Jamestown, N. Y., to Corrugated Bar Co.
100 tons, building for Holland Laundry Co., New York, to Truscon Steel Co.
100 tons for Marshall Field residence, Long Island, N. Y., to Hartmann, Duncan & Rogow, Inc.
100 tons, sewer construction, Baltimore, to Hartmann, Duncan & Rogow, Inc.

CONTRACTS PENDING

800 tons, for Webster avenue sewer, Bronx borough, New York, bids in on general contract.
800 tons, Commodore Perry hotel, Akron, O., revived.
700 to 1500 tons, Schenley apartments, Pittsburgh, to be placed this week.
550 tons, addition to Chevrolet Motor Co. plant, Oakland, Cal., bids being taken.
175 tons, building for Chesebrough Mfg. Co., McKees Rocks, Pa.; action expected during current week.
175 tons, warehouse for P. H. Butler Co., Pittsburgh, bids in.
160 tons, addition to power house of Ohio Public Service Co., Lorain, O., bids asked.
150 tons, for Johnstown Terminal Warehouse, Johnstown, Pa., to be placed this week.
150 tons, research hospital of University of Illinois at Chicago, bids being taken.
135 tons, high school Sharon, Pa., bids in.

Pipe Orders

Small But Aggregate Fair—One Mill Increases Card—Cast Pipe Raised

PIPE PRICES, PAGE 890 AND 952

Pittsburgh, Oct. 3.—Small orders continue the rule in connection with tubular goods but miscellaneous bookings represent a fair aggregate. The usual order for line pipe is for from 50 to 200 tons and many such small sized orders of standard full weight merchant pipe are noted, particularly in the buttweld sizes of galvanized. One Wheeling interest is adding one point to the card rates on black pipe and two points on galvanized. It apparently is able to make better deliveries than the majority of makers in this and the Mahoning valley districts. Mills usually are from 6 to 12 weeks behind on orders although operating at the comparatively high rate of 70 to 80 per cent. This schedule may drop measurably this week because of the Pennsylvania railroad's embargo against steel shipments.

Demand Holds Up

New York, Oct. 3.—While devoid of any municipal tonnage of size, demand for cast iron pipe in this district continues to hold up well. Virtually all makers are booked up over the next two months, and prices continue unchanged.

Quotations $4 Higher

Chicago, Oct. 3.—Formal advance of $4 per ton has been made in cast iron pipe, bringing the quotation to $44, Birmingham, for 6-inch and $48, Birmingham, for 4-inch. Most demand at present is for prompt delivery material, and present conditions of transportation discourage buying for future delivery. Shops in the South have accumulated large stocks, and while shipment is somewhat easier it is not yet sufficient to take care of anything like the tonnage being offered. The situation is quiet aside from an inquiry from Fort Atkinson, Wis., which is taking bids until Oct. 11 for 1400 feet of 6-inch and 1600 feet of 10-inch class C water pipe and 25 tons of special castings for water works extensions.

Pipe Advance Announced

Birmingham, Ala., Oct. 2.—An advance in cast iron pipe prices as anticipated a week ago, has been announced, $3 per ton being added. The base now is $43 to $43.50 for 6-inch. Several lettings have been received by the southern high pressure pipe plants and steady operations will continue. Improved conditions on the railroads is looked for and hope is expressed that shipments of the product will be more liberal than they have been for some time. California points have been buying quite liberally, San Francisco, Santa Barbara, Pasadena and other cities placing contracts, the pipe to be shipped via steamship from Mobile. The National Cast Iron Pipe Co. is working on an order for 3000 tons from Los Angeles. The United States Cast Iron Pipe & Foundry Co. has booked 1250 tons for Eloise, Mich.; 1750 tons for LaPorte, Ind., and 200 tons for Milwaukee. Pipe shops at Anniston, Chattanooga and other southern points are stocking raw material.

Ferro Sales

Include Some Moderate British Tonnage—Spiegel Quiet

FERROALLOY PRICES, PAGE 890

New York, Oct. 3.—A few moderate sized tonnages of English ferromanganese have been sold during the past week at $67.50, c.i.f. tidewater, which is equivalent to $101.10 duty

paid at tidewater. One small lot was sold at this price for January shipment from England. No domestic or German ferromanganese was offered. New inquiry is quiet. Demand for spiegeleisen, following activity of the preceding week, has flattened out and no sales are reported. The market is nominal at $38 to $39, furnace, for domestic metal, and $39.25, duty paid, tidewater, for English metal. These quotations are on the usual 20 per cent grade.

The principal domestic makers of 50 per cent ferrosilicon have advanced their quotations $5 a ton to $70 to $75, delivered, reflecting increased wages, fuel and scrap costs. No Canadian 50 per cent now is being offered. Specifications on earlier lower priced contracts are heavy. Domestic quotations on ferrochrome now show rather a wide range, one maker quoting 12 cents per pound contained on alloy containing 4 to 6 per cent carbon, while another has advanced its price to 14 cents. French material in warehouse still is quoted 10 cents duty paid. Ferrotungsten quotations are irregular, with buying light, following the recent great activity and sharp price advance. Ferrotungsten is quoted nominally 80 to 85 cents a pound; tungsten metal powder 85 cents to $1; and tungsten concentrates, $7.50 to $8 a short ton unit. The ferrovanadium market is firm at $3.50 to $4 a pound contained.

Quoting on Small Lots

Pittsburgh, Oct. 3.—Formal announcement of prices on ferromanganese have not been made by American producers although it is understood some are selling less-than-carload lots on the basis of $100 per ton, f.o.b. furnace, packed in barrels. This may be indicative of where the market will settle. Outside of one or two inquiries for such small lots, practically nothing is being asked. The Reliance Steel Casting Co., Pittsburgh, is understood to be in the market for a small quantity. No quotations are available from domestic makers and the English material is quoted at $67.50, seaboard, with a duty of $33.60 and a freight rate of $4.79 from Baltimore to Pittsburgh, making the delivered price to Pittsburgh common points $105.89 per ton.

Few other inquiries for alloys are being considered but the Pressed Steel Car Co. entered the market last week for three carloads of ferrosilicon, one each 50 per cent, 18 per cent, and 15 to 20 per cent. One inquiry for 100 tons of spiegeleisen is going the rounds from a Kentucky user. Prices from domestic makers remain unchanged at $38 and $39, f.o.b. furnace, on 16 to 19, and 19 to 21 per cent material, respectively. Occasionally an inquiry for a few thousand pounds of ferrovanadium is circulated, on which $3.50 is the minimum figure quoted. Some buyers still are seeking ferrotungsten.

A voluntary petition in bankruptcy filed by the Standard Steel Corp., Milwaukee, reveals liabilities of $24,500, and assets of $51,336. The company manufactures water pumping equipment, concrete mixers and sanitary units for farms. The factory and offices are at 1251 Thirtieth street.

The Nonferrous Metals

Nervousness Marks Some Markets and Prices Less Bullish—Aluminum up 2c—Zinc Easy—Copper Steady

	Copper, Electro delivered	Copper, Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Sept. 27.....	14.00	14.12½	32.32½	6.62½	6.87½	19.00	6.87½	32.00
Sept. 28.....	14.00	14.12½	32.50	6.67½	6.87½	19.00	6.75	32.00
Sept. 29.....	14.00	14.12½	32.75	6.67½	6.87½	19.00	6.75	32.00
Oct. 2.....	14.00	14.12½	33.00	6.67½	6.82½	19.00	6.75	32.00
Oct. 3.....	14.00	14.12½	33.12½	6.67½	6.80	20.00	6.62½	32.00

†Outside market quotation.

NEW YORK, Oct. 3.—The nervous action of the foreign exchanges and unsettlement of sentiment abroad concerning the Turkish situation, caused some easing in foreign metal prices the past week. More cheerful news on Oct. 2 caused some recovery in exchange and in metal prices, reflected here principally in higher import costs for tin. The situation in this country has been affected more by the transportation difficulties and shortage of labor than by external factors. Consumers are having their shipping difficulties and are not inclined to make heavy raw material purchases until the outlook is clearer.

Electrolytic copper has sold at 14.00c, delivered, for deliveries through June, although most producers are not quoting beyond January. This price is being firmly maintained. Recent advances in wage rates in the mining fields have meant an additional producing cost of about ½c a pound and the selling price for copper seems to be on an upward rather than a downward tendency. Export buying of copper has been at a good rate, German purchases being of leading importance, despite the German financial debacle. Brass products prices were advanced ¼c Sept. 27; seamless tubes ½c. Casting copper has held firm at 13.40c to 13.50c, f.o.b. refinery; lake copper at 14.12½c to 14.25c, delivered.

Zinc sold up to 6.87½c, East St. Louis, last week, for prompt shipment, but on Saturday one producer sold October-November shipment at 6.80c. The market has been inactive the past few days, but total September purchases were heavy, including business for shipment into next year. High grade zinc prices were steady at 7.75c, delivered. Sheets are up ¼c.

The lead market has remained in a nominal condition, producers being sold up for October and the only supplies available to consumers not covered by contracts being held by dealers who have been asking fancy premiums. Some business in prompt delivery New York lead is reported at 6.62½c, while for shipment from the west 6.37½c, East St. Louis was done. The statistical position of the market continues strong.

Tin prices fluctuated in accordance with import costs, which moved with the veering sentiment on the Turkish crisis. Both exchange rates and London tin prices reflected the concern felt over the Near East war cloud, but the withdrawal of the Turkish troops from the neutral zone reported Oct. 2 caused cheerfulness, which immediately was reflected in higher exchange rates and higher London tin quotations. Straits tin prices here have swung between 32.37½c and 33.12½c, for all positions. Tinplate makers have been showing a little more interest, but most of the buying has been from the miscellaneous consuming trades. September statistics show a tighter situation.

The domestic aluminum producer advanced its price on ingots 2c a pound, to 21.00c for 98 to 99 per cent and 22c for 99 per cent, virgin ingot. Importers have been holding off, waiting on development of the domestic producer's price policy now that the new tariff of 5c on ingot and 9c on sheets is effective. New business is quiet. An inquiry for 1,000,000 pounds of 98 to 99 per cent and a similar tonnage of alloy is reported.

Mill Products

(Base prices, f.o.b. mill)

SHEETS	
Copper, hot rolled 24 oz., min	21.50
High brass	18.50
Zinc, ga. 9 to 18 (plates ½c less)	8.25
Lead, full sheets (cut, ¼c more)	9.50
Aluminum, base 18 ga. and up	37.40
SEAMLESS TUBES	
High brass	23.00
Copper	24.75
RODS	
High brass, round, ⅛ to 2½ inch	17.00
Naval brass rod	19.00 to 19.50
WIRE	
Copper	15.50 to 16.00
High brass	19.00

Old Metals

(Dealers' Buying Prices)

HEAVY RED BRASS	
Cleveland	9.00 to 9.50
New York	8.50
Chicago	8.50
HEAVY YELLOW BRASS	
New York	6.25 to 6.50
Chicago	6.50
Cleveland	6.00 to 6.50
ZINC	
New York	3.50 to 4.00
Cleveland	3.50 to 4.00
HEAVY COPPER AND WIRE	
Cleveland	11.00 to 11.50
New York	11.00 to 11.50
Chicago	11.00
RED BRASS TURNINGS	
New York	7.75 to 8.25
Cleveland	8.00 to 8.50
Chicago	7.25
YELLOW BRASS TUBING	
Cleveland	5.50 to 6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.75 to 7.00
Chicago	6.00
ALUMINUM BORINGS	
Cleveland	6.50 to 7.00

45 Stacks Resume in September

Total of 188 Active Furnaces Second Highest for the Year—Pig Iron Production Again Passes 2,000,000-Ton Mark, Making a Recovery of Over 200,000 Tons from August Output—Nonmerchant Iron Gains Sharply

RECOVERY of blast furnace operations, following the recent coal and rail strikes, was shown most impressively by the net increase of 45 active furnaces during September. Production of pig iron, while gaining over 200,000 tons over August, did not reflect completely the improved operations, due to the one-day shorter month as well as the fact that many of the furnaces resumed late in the month. It is interesting to note that the net gain in operating furnaces

MONTHLY PRODUCTION

	1922	1921	1920
January	1,645,804	2,414,753	3,012,373
February	1,630,180	1,929,394	2,984,257
March	2,035,908	1,594,866	3,375,768
April	2,070,161	1,190,751	2,752,670
May	2,309,348	1,215,272	2,991,825
June	2,362,455	1,064,007	3,046,623
Total 1st half	12,053,856	9,409,043	18,163,516
July	2,403,030	864,642	3,043,918
August	1,810,665	954,901	3,145,536
September	2,016,778	985,795	3,124,308
October	.....	1,234,450	3,288,341
November	.....	1,414,958	2,935,081
December	.....	1,642,775	2,700,268
Total 2nd half	.....	7,097,521	18,237,452
Grand total	18,284,329	16,506,564	36,400,968

was the largest of any single month since the steel strike, when in October 1919, 53 furnaces resumed. Total production of pig iron in September was 2,016,778 gross tons, a gain of 206,113 tons over the August output of 1,810,665 tons. The increase recovered approximately one-third of the loss shown in August.

Merchant iron produced in September totaled 349,087 tons which compared with 343,522 tons in August, was a gain of 5565 tons. On an average daily basis

AVERAGE DAILY PRODUCTION

	1922	1921	1920	1919	1918
Jan.	53,090	77,895	97,172	106,654	77,523
Feb.	58,220	68,906	102,904	105,270	82,794
Mar.	65,674	51,447	108,895	99,614	103,548
Apl.	69,005	39,691	91,754	82,479	109,112
May	74,495	39,202	96,510	67,991	111,351
June	78,748	35,466	101,533	70,467	110,538
July	77,517	27,892	98,190	78,200	109,954
Aug.	58,408	30,802	101,468	88,453	108,983
Sept.	67,225	32,857	104,143	82,692	113,774
Oct.	.....	39,821	106,075	60,142	112,335
Nov.	.....	47,165	87,836	80,244	111,595
Dec.	.....	52,992	87,105	84,711	110,602
Ave.	66,975	45,223	99,456	83,910	105,290

this represented 11,636 tons per day, or an increase of 555 tons over the 11,081 tons of the preceding month. Nonmerchant or steelworks output in September was 1,667,691 tons, which compared with the 1,467,143 tons of August, was a gain of 200,548 tons. Reduced to an average daily basis, the September steelworks output was at a rate of 55,589 tons per day or a gain of 8262 tons over the 47,327-ton rate of the month before. Production of both merchant and nonmerchant iron in September was at the rate of 67,225 tons per day compared with the 58,408 tons of August.

Furnaces active on September 30 totaled 188, as compared with 143 on August 31 and was the second highest number of stacks operating at the close of any month this year, 191 being active on June 30. Eleven merchant stacks were blown in during September and 3 blown out, the net gain being 8 stacks. Of the nonmerchant class 42 stacks were blown in and 5 blown out or banked, the net gain being 37 stacks. The total net gain of both therefore was 45 stacks.

Stacks blown in during the month were: In Ohio: Haselton Nos. 2, 3 and 4, Republic Iron & Steel Co.; Belfont, Belfont Iron Works; one LaBelle, LaBelle Iron Works: Milton, Milton Iron Co.; Lorain No. 2, National Tube Co.; Mary, Sharon Steel Hoop Co.; Youngstown "D", Youngstown Sheet & Tube Co.; one Central, American Steel & Wire Co.; Trumbull Cliffs, Trumbull-Cliffs Furnace Co.; Toledo "B", Pickands, Mather & Co.; Dover, M. A. Hanna & Co.; Cleveland, Nos. 1 and 2, Otis Steel Co.; Jeanette and Tod, Brier Hill Steel Co.; Mattie, A. M. Byers Co. of Ohio. In Pennsylvania: One Bethlehem, Bethlehem Steel Co.; four Cambria, two Coatesville, Midvale Steel & Ordnance Co.; Perry, Pickands, Mather & Co.; three Eliza, one Soho, two Aliquippa, Jones & Laughlin Steel Co.; Punxy, Punxsutawney Furnace Co. In New York: Donner No. 2, Donner Steel Co.; Lackawanna Nos. 3, 4, 7, Bethlehem Steel Co.; Buffalo "A", M. A. Hanna & Co. In Maryland: One Maryland, Bethlehem Steel Co. In Tennessee: Cumberland, Warner Iron Co.; one Allens Creek, Bon Air Coal & Iron Corp. In Alabama: Ensley No. 1, Tennessee Coal, Iron & Railroad Co. In Indiana: Gary Nos. 1, 2, 5 and 7, Illinois Steel Co.; one Madeline, Inland Steel Co. In Illinois: South Works Old No. 3, South Works New Nos. 6 and 8, Joliet No. 1, Illinois Steel Co. In Michigan: Detroit "A", M. A. Hanna & Co. In Colorado: One Minnequa, Colorado Fuel & Iron Co.

Stacks blown out during September were: In Ohio: One Buckeye, American Rolling Mill Co. In Pennsylvania: Robesonia, Robesonia Iron Co., Ltd. In Alabama: One furnace, Woodward Iron Co.; Ensley No. 5, Tennessee Coal, Iron & Railroad Co. In Kentucky: Ashland No. 2, American Rolling Mill Co. In Indiana: Gary No. 2, Illinois Steel Co. In Illinois: South Works New No. 9, Illinois Steel Co. In Wisconsin: One Bay View, Illinois Steel Co.

DIVISIONS OF PRODUCTION

1921	Merchant	Non merchant	Spiegel	Ferromanganese	Other ferro
Jan.	474,135	1,940,618	2,542	20,960	4,950
Feb.	338,383	1,591,011	11,566	17,447	4,067
Mar.	276,559	1,318,307	19,746	17,682	3,222
Apl.	238,539	952,212	14,744	13,266	3,163
May	215,703	999,569	2,379	6,853	4,553
June	178,854	885,153	....	4,536	6,090
July	141,326	723,316	4,015	1,509	3,178
Aug.	134,491	820,410	....	3,878	....
Sept.	157,728	828,067	....	3,289	35
Oct.	218,990	1,015,460	....	3,902	990
Nov.	304,535	1,110,423	....	3,525	1,065
Dec.	372,000	1,270,775	....	3,847	1,064
Tot'l.	3,051,243	13,455,321	55,042	100,694	32,377
1922					
Jan.	388,322	1,257,482	1,230	5,644	825
Feb.	355,455	1,274,725	4,930	3,618	872
Mar.	390,643	1,645,265	2,095	11,604	1,102
Apl.	375,814	1,694,347	4,211	14,998	828
May	410,404	1,898,944	4,902	15,432	405
June	423,672	1,938,783	4,817	18,254	854
July	441,752	1,961,278	7,176	18,873	1,887
Aug.	343,522	1,467,143	7,925	11,402	976
Sept.	349,087	1,667,691	4,235	10,681	934

SEPTEMBER PIG IRON

	No. of stacks	No. in blast last day of month: Sept.	Aug.	Total tonnage made: Merchant	Nonmerchant	Totals: September	August
Pennsylvania	159	70	56	34,072	710,999	745,071	636,828
Ohio	80	40	23	58,501	401,343	459,844	368,871
Alabama	43	22	23	129,488	74,176	203,664	204,389
Virginia	19	..	..	.....	.....	.....	.....
New York	26	12	7	31,620	81,015	112,635	77,221
New Jersey	4	1	1	2,736	.....	2,736	11,604
Illinois	26	12	9	35,907	141,611	177,518	185,307
Colorado	5	1	..				
Indiana	16	12	8	12,286	210,325	222,611	201,605
Maryland	6	3	2				
Wisconsin	6	1	2				
Kentucky	7	1	2				
West Virginia	5	1	1	14,141	14,811	28,952	58,223
Tennessee	14	7	5				
Washington	1	..	..				
Georgia	2	..	..				
Texas	1	..	..				
Minnesota	3	2	2	22,783	25,114	47,897	46,314
Michigan	3	3	2				
Missouri	1	..	..				
Spiegel and ferro—all states	..	..	..	7,555	8,297	15,850	20,303
Totals	427	188	143	349,087	1,667,691	2,016,778	1,810,665

Expects More Drastic Car Ruling

Official Washington Talks of Barring All Freight Except Food and Fuel—Coal and Railroad Authorities Dislike Prospective Action—Fuel Distributor Spens Cannot Promise Steel Industry Relief Short of 30 Days

WASHINGTON, Oct. 3.—Federal Fuel Distributor Spens said today he believes it will be 30 days at least before the iron and steel industry can look for any modification of the interestate commerce commission order reserving to the coal trade away from the mines open-top cars with sides higher than 42 inches. The presidents and many traffic officials of Mahoning and Shenango valley works have apprised him of the backing-up of finished products owing to car shortage, Mr. Spens said, but no relief is in sight at present.

The great increase in the number of embargoes has precipitated talk of more drastic action by the commerce commission, to the point of barring the transportation of everything except food and fuel for a stated period. Mr. Spens himself has hinted of such a step in his letter to the railroads seeking a speeding-up. At this time, however, it would seem that the commission will give the carriers a period in which to extricate themselves by embargoes.

Mr. Spens continues to view the situation as one of transportation and not of fuel. All of his efforts are being bent toward righting transportation. The bituminous coal situation is held to be at approximately normal, including the lakes, while anthracite is being allotted on the basis of 60 per cent of last year. Whether stocking of bituminous coal by upper lake ore interests will be permitted has not been presented, Mr. Spens stated.

Mr. Spens has proceeded to block out the United States into 17 bituminous coal producing districts, for the purposes of the Winslow act, and has asked operators to begin the submission to him of daily reports giving the tonnages shipped, price and destination. This has aroused some opposition in the industry, and while no action has been taken by any coal association, individual operators have retained attorneys to give an opinion whether the act could be attacked on constitutional grounds. Mr. Spens also has set up an advisory industrial committee, whose task will be to persuade all users to purchase only immediate needs, to supply promptly material for the repair of locomotives and cars, to refrain from stocking and to unload cars expeditiously.

This advisory committee includes, among others, James A. Campbell, of the Youngstown Sheet & Tube Co., Youngstown, O.; R. P. Lamont, of the American Steel Foundries, Chicago; Eugene R. Grace, of the Bethlehem Steel Corp., Bethlehem, Pa.; and S. P. Bush, of the Buckeye Steel Castings Co., Columbus, O. Another advisory committee has been formed for transportation, of which Daniel E. Willard, of the Baltimore & Ohio, is chairman. A meeting of this committee will be held this week, possibly Thursday morning in Washington, and the matter of relieving the car supply situation for the iron and steel industry may be one of the topics.

Mr. Spens has recommended to the commerce commission that no change be made at present in the rules governing the reconsignment of coal. In a letter to the commission, and a second one to the railroads, he has said:

"It is true, that at about the time the coal strike was ended there was at certain terminals quite a quantity of coal on hand awaiting disposition, but this was due largely, I think, to the fact that this coal had been purchased at high prices, with the result that the breaking of the strike made it difficult for the operators or jobbers to find customers. Today there appears to be an exceedingly small percentage of the total loading of cars held for reconsignment, approximately one-third of 1 per cent, and I am inclined to the opinion that, with the big demand for coal that now exists and with the instructions that you have extant that consignees must unload within 24 hours or be embargoed, that we need not, just at this time, have much apprehension that the privilege will be dangerously abused. As a matter of fact, in many instances it perhaps works toward a reduction in prices, and likewise in many instances actually makes for a more prompt disposition of the coal and release of the equipment than might otherwise be the case.

"In the event the views of the interstate commerce commission should coincide with my own, this department can perhaps, be of some assistance by cautioning handlers of coal that unless cars are promptly released it might become necessary for us to recommend to the interstate commerce commission, the cancellation of the present privileges, or drastic restrictions.

"Due to the dual strikes there is, of course, a dearth of coal. Consumers, domestic as well as industrial, have been urged only to purchase coal for immediate requirements. Current transportation is adequate for current needs, but not sufficient to permit of reserves. An early cold snap would play havoc with consumers as well as with the power of the railroads. There might be actual distress.

"It has been suggested that, perhaps, there should be a temporary cessation in transportation of certain other classes of trafic, that more equipment and power might be applied to coal. In my judgment, it would be regrettable if any action in that direction should become necessary."

Coke Production Gains; Coal Output Lags

Beehive coke production in the United States in the week ended Sept. 23 totaled 135,000 tons, according to estimates of the geological survey. This is an increase of 12,000 tons over the revised figures showing the output of these ovens in the week before. Cumulative beehive production including the last week reported places the total at 4,625,000 tons for the year, compared with 4,034,000 tons in the same period last year and 22,489,000 tons in the same time in the war year of 1918. Tonnage by districts is shown as follows:

	Week ended		
	Sept. 23, 1922	Sept. 16, 1922	Sept 24, 1921
Pennsylvania and Ohio.	95,000	84,000	54,000
West Virginia	12,000	9,000	2,000
Alabama, Tennessee and Georgia	10,000	10,000	4,000
Virginia and Kentucky..	9,000	10,000	5,000
Colorado and New Mexico	5,000	5,000	2,000
Washington and Utah..	4,000	5,000	3,000
Total United States..	135,000	123,000	70,000
Daily average	23,000	21,000	12,000

Coal production last week amounted to between 11,400,000 and 11,800,000 tons of both bituminous and anthracite as against 11,558,000 tons in the week before, according to the survey's estimates. The level is insufficient to meet the country's needs, it is pointed out.

Green Engineering Sold

George E. Learnard, president of the International Combustion Engineering Corp., New York, announces the acquisition of the entire capital stock of the Green Engineering Co. of East Chicago. The latter company manufactures chain grate stokers, auxiliary boiler room equipment, special furnace arches and castings. The plant of the Green Engineering Co. covers 12 acres and the plant and inventory are valued at about $1,000,000. The Green company has approximately $500,000 cash on hand with accounts payable of less than $50,000.

Reflect New Role of Alloy Steel

Convention and Exhibition of American Society for Steel Treating Indicate Importance of Alloy Steels in Automotive Industry—Papers Mark Advance in Metallurgy of Heat Treating—Elect Officers

DETROIT, Oce. 3.—Hand in hand, heat treating and forging have contributed to almost every step in the advancement and growth of the great automotive industry, and concurrently have transformed the production of alloy steel from an unimportant position to one of power and independence. The evidence of this transformation is the most striking feature of the convention, opened Monday in the General Motors building, Detriot, by the American Society for Steel Treating.

While the progress in the field of heat treating and forging is reflected most clearly in the technical papers on the programs of the steel treaters' society and the American Drop Forging institute, the most tangible indication of the role of steel in the automotive industry is given by the exhibition of the products of nearly a hundred manufacturers being held on the fourth floor of the spacious new building, which itself is a monument to the greatness of the automobile.

More than 30 steelmakers are exhibiting cast, forged, pressed and machined parts made from commercial and special carbon and alloy steels. The articles range in size from needles and surgical instruments to heavy crankshafts, and in variety from steel frames for tennis rackets to all-steel airplane propellers. Steel alloyed with molybdenum, vanadium, chrome, titanium, nickel, and other elements is exhibited in the form of crankshafts, gears, pinions, tool bits, drills, reamers, and countless other products used in the machine shop.

Furnace Equipment Shown

Heat resisting alloys for carbonizing and annealing boxes are demonstrated by a number of manufacturers, while high temperature cement, refractories, thermocouples and other equipment having the property of resisting high temperatures are shown in several booths. Heat treating furnaces, equipment for the electrical control of heat, and an unusually complete line of electrical recording instruments round out the exhibits of material and apparatus used in heating steel preparatory to treating. Manufacturers of case hardening supplies are well represented at the exhibition.

Several machine tools are shown in action, the most interesting of which is a mechanical engraving machine which mills a die block to the exact size and shape of a finished block which serves as a model. No full size forging machines are shown in action, due to their size and to the noise incidental to actual operation.

Hardness testing machines, a rivet heater, a hot billet scraper, and a display by the United States bureau of standards are among the other points of interest at the exposition.

The opening session of the convention was held Monday afternoon. C. T. Bragg, Michigan Smelting & Refining Co., Detroit, welcomed the members of the association on behalf of Mayor James Couzens, and following the response by F. P. Gilligan, Henry Souther Engineering Co., Hartford, Conn., retiring president, the tellers announced the result of the ballot for new officers, which appears elsewhere on this page.

Prsident-elect T. D. Lynch, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., spoke briefly, outlining a number of recommendations for the handling of committee work. Following reports by the secretary and treasurer, a gold medal was presented to E. J. Janitzky, metallurgical engineer, South works, Illinois Steel Co., for preparing the best technical paper presented at the Indianapolis convention last year. J. P. Gill and L. D. Bowman, metallurgists, Vanadium Alloys Steel Co., Latrobe, Pa., received a silver medal for their paper, "The Metallurgy of High Speed Steel," also presented at the Indianapolis convention. F. P. Gilligan delivered the address of the retiring president, touching upon the achievements of the society during the past year.

Discuss Carburizing

H. M. Boylston, Case School Applied Science, presided at the Tuesday morning session, which was devoted to a symposium on carburizing. H. B. Knowlton, Vocational School, Milwaukee, discussed the factors affecting carburizing and decarburizing in case hardening. He touched upon the effect of the temperature of the lining of the furnace and the ratio of the weight of the charge to the weight of the lining upon the speed of heating. Tests on low carbon steel treated with cyanide were described by A. H. d'Arcambal, metallurgist, Pratt & Whitney Co., Hartford, Conn. This paper shows that the hardness of the steel in the tests was due to carbon, and more particularly to nitrogen.

E. W. Ehn, Timken Roller Bearing Co., Canton, O., presented a paper dealing with the effect of improperly made steel on case hardening. He said that failure in case-hardening, especially in reference to soft spots, is often due to improper steel. Variation of structure of a carburized piece gives a direct indication whether the steel is suitable for carburizing or not.

The results obtained in heat treatment of all kinds of steels, notably high and medium carbon steel, is dependent on the presence of oxides in the steel, and many mysterious failures, especially in hardening, are likely to find their explanation by carburizing, and a microscopical examination of the structure obtained.

Instead of the usual summer reduction in employment in manufacturing plants in New York state, there was an increase of 2 per cent during August, according to reports received by the industrial commissioner, Henry D. Sayer. The principal factors in the increase were substantial gains in employment in the metal working industries and seasonal changes in the wearing apparel industry.

New Officers

AMERICAN SOCIETY FOR STEEL TREATING

President
T. D. LYNCH
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

First Vice President
R. J. ALLEN
Rolls-Royce Co. of America, Springfield, Mass.

Second Vice President
W. S. BIDLE
W. S. Bidle Co., Cleveland

Secretary
*W. H. EISENMAN
4600 Prospect avenue, Cleveland

Treasurer
J. V. EMMONS
Cleveland Twist Drill Co., Cleveland

Directors
J. J. CROWE
United States navy yard, Philadelphia
A. E. WHITE
University of Michigan, Ann Arbor, Mich.
S. M. HAVENS
Ingalls Shepard division, Wyman Gordon Co., Harvey, Ill.
F. P. GILLIGAN
Henry Souther Engineering Co., Hartford, Conn.

*Re-elected.

Coast Rail Trade Active

Southern Pacific Co. Increases Inquiry from 1200 to 11,000 Kegs of Spikes for Extended Delivery—Germans Seek Business

SAN FRANCISCO, Sept. 30.—Iron and steel trading continues active, prices remain firm and the delivery situation less acute. A marked increase in demand for labor reflects the condition of the industries. Reports from Los Angeles show 2648 building permits issued up to Sept. 19, with a valuation of $6,155,654.

Bars, Plates and Shapes

Demand for merchant steel bars is not heavy. Bar mill operators are in a position to handle promptly any tonnages offered and as a result no shortage is noticed. Seven out of 12 open-hearth furnaces are in operation.

No large tonnages of plates have been reported this week, though several oil companies have inquiries out for a number of 55,000 and 80,000-barrel tanks upon which no action has yet been taken. The General Petroleum Co. is reported to have closed on 1400 tons for four 80,000 barrel tanks but confirmation is lacking. While 2.55c to 2.70c delivered San Francisco appears to be the common price it is understood that 2.45c delivered could be obtained on desirable specifications.

Local fabricators of structural shapes report their shops filled for sometime to come and at least one plant has four months orders booked. Deliveries are causing concern as 12 weeks mill shipment appears to be the best obtainable. Prices are firm at 2.45c delivered San Francisco.

Other Finished Material

Sheet buying is being maintained. The 3.35c and 4.35c base Pittsburgh price on black and galvanized sheets respectively has disappeared now that the leading interest has withdrawn from the market and 3.50c and 4.50c respectively for black and galvanized material now is the prevailing price. One interest is quoting 4.92½c delivered San Francisco on galvanized sheets which figures back somewhat under 4.50c base Pittsburgh according to present water and rail rates.

The Alaska engineering commission was to open bids on Sept. 29 for 2750 tons of 70-pound rails, 6000 pairs of angle bars, 1000 kegs of 9/16 x 5½ track spikes and 160,000 tie plates. German makers are seeking business actively and one interest received a price of $41.11 delivered San Francisco for 60-pound rails with all accessories, 12 weeks mill shipment. The Southern Pacific Co. has increased the size of their last two inquiries for track spikes and bolts from 1200 kegs of 9/16 x 5½ spikes to 11,000 kegs, 1200 kegs to be shipped at once and the balance in equal monthly shipments starting Jan. 1923 and continuing until June 1924. One interest, in submitting a bid, has refused to consider anything beyond July 1, 1923.

No let up in demand for standard pipe is noted and building sizes are in special demand. Oil country goods are holding up and delivery is in a better position than that for standard goods. Oil field operations reported to the state oil and gas supervisor for the week ending Sept. 23 show 27 new wells started, as compared with 39 the previous week. Total new wells this year to date is 1021, as compared with 1036 for same period last year. Deepening or redrilling jobs numbered 15, as compared with 14 the preceding week. Total to date this year 594; total same date last year 550.

Only one cast iron pipe award is noted this week, which called for 250-tons of 4 to 10-inch for Pasadena, secured by the United States Cast Iron Pipe & Foundry Co. Tacoma has rejected all bids on 1100 tons of 30-inch and will draw up new specifications. Alhambra is expected to open bids on Oct. 2 for 456 tons of 6 to 18-inch.

Prices for wire and wire products are firm. Warehouse stocks are broken and in nearly all lines a shortage is noted. Deliveries are important at present and only a slight improvement has occurred. The leading interest is maintaining a c.i.f. San Francisco price of 3.10c, 2.70c and 3.40c for plain wire, cement-coated nails and wire nails respectively.

Warehouse Market

Jobbers report continued improvement in demand for out-of-stock material. Sheets and pipe are most active. Local prices on some items have been changed as follows: Nails, bright 4.00c to 4.10c; cement-coated 3.20c to 3.30c; boiler rivets 4.85c to 5.10c; structural rivets 4.75c to 5.00c; machine bolts large 40-5 off to 40 off and machine bolts small from 45 off to 40-5 off. Los Angeles prices have been changed as follows: Shapes 3.65c to 3.60c; plates 3.85c to 3.65c; nails bright from 4.10c to 4.20c; cement-coated to 3.45c; boiler rivets 4.80c to 5.10c; structural rivets 4.70c to 5.00c; machine bolts large from 40-5 off to 40 off and machine bolts small from 45 off to 40-5 off.

Stocks Depleted

In Some Lines on Coast—Pig Iron Market Is Strong

Seattle, Sept. 30.—The iron and steel situation is firm and business good despite several handicaps including a car shortage which is interfering with some lines of business. Mill representatives are getting back into the market although there are some items on which quotations are not available and others on which deliveries are uncertain. Stocks are depleted in some lines. The export trade is quiet except for steel bars and scrap

Pig Iron and Coke

The pig iron market is strong due to advancing prices at base. A local importing company has just purchased a lot of Glengarnock iron paying 10 shillings more than for the previous order. Foreign manufacturers are taking advantage of the domestic situation and have raised prices. No domestic iron is in the market, the entire demand now being supplied from foreign sources. No. 1 pig iron is being sold at from $32.50 to $33, including tariff, f. o. b. buyer's plant. One lot of British hematite iron was sold by a local house at $32. Oriental stocks of pig iron have all been absorbed and no additional orders placed. Demand for iron continues brisk with one importing house having sold 450 tons.

Fernie, B. C. Coke is being offered at the same base prices as prevailed prior to the strike. However, railroad freights have been reduced about 50 cents in the meantime so that this product can be laid down at about $16.50, practically the same price as that for British and Scotch coke. In the last six months domestic consumers have come to favor foreign coke which is claimed to be superior to the Canadian grade. Uncertainty of delivery is the handicap but in view of the parity of prices some interesting competition is expected.

Bars Plates and Shapes

The steel mill reports an excellent business with merchant bars strong at 2.65c and reinforcing at 2.70c. The local plant is operating at about 75 per cent capacity. More export inquiries are noted from China, there being no demand from Japanese sources. Another lot of 500 tons of reinforcing bars has been sold to China within the week.

Other Fnished Material

Local jobbers report demand for all items. Sheets are moving in large volume while everything used in logging and lumbering is being sold in liberal quantities. Stocks are low, especially in small sizes of pipe for which a steady demand continues. Owing to the increased cost at base warehouse prices on machine bolts at Seattle, Portland and Tacoma have been advanced from 40 to 35 per cent off, effective this week.

Old Materials

Scrap dealers report improved conditions. No difficulty is encountered in selling any grade of scrap the principal anxiety of dealers being to replenish stocks which are low. Practically no steel scrap is available although inquiries from Japanese buyers continue in large numbers. This item is firm at $11. One company has just sold 1000 tons to Japan. No. 1 cast iron scrap is also selling in larger quantities at around $20.

The new westbound Pacific conference reorganizing this week tentatively has agreed on a new rate of $6 on steel to the Orient as compared with present rates of $4 and $5 and with the all water rate from Atlantic ports of $8. Influence is being brought to re-establish the intercoastal conference. On this route open rates have prevailed since July 1 since which time steel has dropped from 60 cents to 30 cents per 100 pounds.

Seattle will open bids October 6 for furnishing high tension wiring materials including wire, copper tubing, etc., to be used in connecting the municipal power and light plants of Seattle and Tacoma. The work is expected to cost $150,000. On the same date bids will be received for erecting a power transmission line 15 miles long.

British Iron Buying Unchecked

New Duty of 75 Cents Per Ton Has Small Effect on Sales to United States—30,000 Tons Additional Booked—Belgian and French Production Steadily Rising—German Competition Disappearing

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

Sterling—$4.40

LONDON, Oct. 2.—Five Scotch and one English blast furnaces are being blown in largely due to the demand for pig iron and other products from the United States and Canada. Activity in new business with the United States especially in pig iron has been unchecked by the new American tariff act which levies a 75 cents a ton duty. About 30,000 tons additional of British iron has been sold to American buyers. A rise of 3 shillings ($0.66) in the price of coke has caused one Staffordshire furnace to blow out.

Some slight improvement in ship building and a general revival in building work are contributing toward a more active steel situation.

Semifinished steel is easier. Belgian joists now are underselling the English product 15 shillings ($3.30) per ton. Cheaper petrol has caused an increase in the demand for motor sheets. British tin plate mills are shutting down because of recent trade dullness in this line which has been accentuated by the Turkish crisis.

French and Belgian pig iron production is expanding and many furnaces have resumed, but a shortage of coke tends to handicap operations. Plates and sheets have been advanced 10 to 30 francs ($2.27) per ton. Two mills have booked 23,000 tons of rails for the Argentine. German competition has practically disappeared.

American Iron Demand Bolsters British Market

European Staff Special

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—4.43

BIRMINGHAM, Eng., Sept. 25.—American demand for pig iron continues to feature the British market. Last week's statistics suggested the movement had reached its climax and might be expected to show a gradual decline. But shipments are being made on a large scale from the Tees. Already the figures are well ahead of last month. Ship tonnage has been arranged for shipping to America of another 28,000 tons of Middlesbrough iron. In spite of the drop in price in American foundry iron, Cleveland iron can still be landed in the United States below the home price. Recent advices as to heavy sales of imported iron in New York encouraged the British pig iron interests in the belief that the demand from this country is not likely to slacken immediately. In view of the slow growth of domestic trade, however, smelters are not hastening to blow in additional furnaces, and no addition to the number in blast has been made during the past week.

Canada has been in the market for British pig iron and inquiries from that quarter appear to be increasing. Cleveland ironmasters in fact could sell more iron than they are now producing but they want to be assured of a certain demand before they light more furnaces and coke ovens. No. 3 Cleveland G. M. B. has become firmer at £4 15s ($21.04). During the past week there have been few sales under that figure. The position at Middlesbrough is strengthened by the fact that America has cleared all the spare iron in Scotland, and buyers there are coming into the market for Cleveland iron. Some sales of West Coast hematite have been made to the United States, but for East Coast hematite there is little such demand. This iron is at present one of the weakest in the market.

Midland smelters are benefiting indirectly from the American demand. The scarcity of northern iron has enabled them to make some advantageous sales in Lancashire and other districts which usually are dependent upon Cleveland. There have also been further inquiries in the Midlands for pig iron for America and Canada. To both these countries small lots have been dispatched from North Staffordshire, Northamptonshire and Derbyshire. The inquiry is for special qualities of iron of which the Midland output is not great, and as railway charges add to cost at the ports this trade is not likely to reach any high figure. North Staffordshire foundry iron No. 3 is quoted at £4 4s ($18.60), Northamptonshire foundry at £4 ($17.72) and Derbyshire foundry at £4 2s 6d ($18.27), all at the furnace.

In all British markets steel is in an unstable price position. Competition for business is keen. This section of the market is suffering more than others from the uncertainty as to political developments in the Near East. The possibility of war naturally causes hesitancy in regard to all overseas business and it is upon the export trade that the British steel manufacturers are relying chiefly to keep their works going. Domestic requirements continue small in view of the almost stagnant condition of the shipbuilding industry. One or two new orders, including one for a new vessel for the Orient Steam Navigation Co. are thought likely to be placed on the Clyde. However, there is no prospect of a substantial revival of shipbuilding this year. The chief demand for constructional steel at home is for small building and engineering contracts, the number of which shows a slow improvement. Prices for joists and angles are maintained but there has been some cutting in certain descriptions of plates. Lower prices for export than for home consumption are being quoted on the West Coast.

During the past week the British markets, in the Midlands and in the North, have witnessed a revival of Belgian competition. Belgian billets now are on sale at £6 17s 6d ($30.45) delivered in the Midlands. This competition coupled with decreasing home demands has brought down the price of British billets to £7 2s 6d ($31.56). Nut and bolt iron is being offered by the Belgians at £8 10s ($37.65) delivered, the price of the material produced in the Midlands being £9 10s ($42.08). Some South Wales mills are offering billets and sheet bars at less than £7 ($31.01). The Ebbw Vale steelworks which, after a long period of closing, reopened two or three months ago are again idle. The cause of the stoppage is a dispute with the miners in the company's collieries.

Makers of galvanized sheets are doing an improved business especially in the export trade, and the quotations at works now are firmly maintained at £16 7s 6d ($72.54) to £16 10s ($73.09). Some good orders for the Far East for plates have been received at Swansea and the Midland mills which are running are well occupied. The tin plate trade is finding the position more and more unsatisfactory. The nominal price for forward plates is 19s ($4.20) f.o.b. and 19s 3d ($4.26) for prompt shipments. Although manufacturers complain these prices are below the cost of production they are difficult to obtain. Some classes of workmen are pressing

Current Iron and Steel Prices of Europe

British Market

Home Market Prices. Gross Tons at Works or Furnace.

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	28.05	6 7 6
Sheet bars	27.50	6 5 0
Wire rods	40.70	9 5 0
FINISHED STEEL		
Steel bars, England, ¾ to 3-inch	36.85	8 7 6
Steel bars, England, ¾ to 3-inch, for export	35.20	8 0 0
Plates, ship, bridge and tank, England	36.85	8 7 6
Plates, ship, bridge and tank, England, for export	35.20	8 0 0
Plates, ship, bridge and tank, Scotland	36.85	8 7 6
Plates, ship, bridge and tank, Scotland, for export	35.20	8 0 0
Beams, England	36.30	8 5 0
Beams, England, for export	35.20	8 0 0
Beams, Scotland	35.20	8 0 0
Beams, Scotland, for export	34.10	7 15 0
Sheets, black, 24 gage	45.10	10 5 0
Sheets, galvanized, 24 gage	71.50	16 5 0
Rails, 60 lbs. and over	35.20	8 0 0
Rails, 60 lbs. and over, for export	33.00	7 10 0
Tin plate, base box, 108 lbs.	4.13	0 18 9
Steel hoops	45.10	10 5 0
Steel hoops, for export	44.00	10 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	19.80	4 10 0
Hematite, West Coast, Mixed Numbers	19.58	4 9 0
Basic, Middlesbrough	18.15	4 2 6
No. 3 Foundry, Middlesbrough	20.35	4 12 6
No. 3 Foundry, Derby, Leicester, Nottingham	18.15	4 2 6
No. 3 Foundry, Northamptonshire	17.05	3 17 6
No. 3 Foundry, Staffordshire	18.15	4 2 6
No. 3 Foundry, Scotch	22.55	5 2 6
Ferromanganese, 76 to 80 per cent	66.00	15 0 0
Ferromanganese, 76 to 80 per cent, for export	62.70	14 5 0
COKE		
Yorkshire furnace	4.62	1 1 0
Yorkshire foundry	6.05	1 7 6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	19.83	30,506
Foundry, No. 3, Oberhausen	17.80	26,454
Bessemer Stahleisen, Siegen	19.40	29,838
Foundry, No. 1, Oberhausen	17.24	26,524
Luxemburg Foundry	16.09	24,756
COKE		
Ruhr furnace	3.91	6018
Ruhr foundry	4.07	6257
SEMIFINISHED STEEL		
Billets	24.66	37,940
Sheet bars	26.43	40,660
Wire rods	25.70	39,530
FINISHED STEEL		
Standard rails	30.95	47,500
Merchant bars	30.51	46,930
Structural shapes	30.15	46,380
Ship plates	34.29	52,750
Medium plates, 3 to 5 millimeters	38.82	59,730
Sheets, below 3 millimeters	42.62	65,570
Tin plate	66.30	102,000
Plain wire	32.76	50,400
Bands and strips	35.38	54,430

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	21.60	285
Basic Bessemer, Lorraine	16.68	220
Foundry, Longwy, No. 3, sand-cast	15.92	210
Foundry, Longwy, No. 3, chill-cast	16.68	220
Ferromanganese, 76 to 80 per cent	71.63	945
COKE		
French furnace	7.20	95
German furnace, f.o.b. frontier	7.20	95
French foundry	9.40	124
SEMIFINISHED STEEL		
Blooms	24.26	320
Billets	26.15	345
Sheet bars	27.29	360
FINISHED STEEL		
Standard rails	41.69	550
Merchant bars	33.73	445
Angles	36.01	475
Normal beams and profiles	36.01	475
Plates, ship and tank, 10 millimeters and thicker	44.72	590
Plates, bridge and tank, 5 to 10 millimeters	48.51	640
Sheets, black, 3 millimeters	54.58	720
Sheets, blue annealed, 2 millimeters	68.22	900
Shafting, cold-drawn, 40 to 60 millimeters	64.43	850
Bars, 2 per cent nickel steel	83.38	1100

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	15.33	215
Basic open-hearth, Belgian	15.69	220
Gray forge, Belgian	15.33	215
Foundry, No. 3, Belgian	16.40	230
Foundry, No. 3, Luxemburg	16.40	230
Foundry, No. 3, Lorraine	16.40	230
SEMIFINISHED STEEL		
Blooms	22.82	320
Billets	24.60	345
Sheet bars	25.67	360
Wire rods	36.01	505
FINISHED MATERIAL		
Standard rails	30.30	425
Merchant bars	31.02	435
Normal beams and profiles	29.59	415
Plates, 5 millimeters and thicker	34.22	480
Sheets, black, 3 millimeters	38.15	535
Sheets, galvanized, 1 millimeter	101.60	1425
Plain wire	43.49	610
Galvanized wire	56.13	785
Wire nails	36.01	505

All prices are f.o.b. furnace or works.

for advances of wages and already there has been one stoppage of work. The disturbance is thought likely to become widespread, but employers, in view of the present unremunerative prices, probably will be prepared to close their mills indefinitely. The continental demand continues unsatisfactory but there have been a fair number of inquiries from India, Canada, Australia and South America. The Swansea harbor trust tin plate returns for last week were: Receipts, 97,801 boxes, shipments 85,399 boxes and stocks 142,678 boxes, as compared with 130,276 boxes the previous week and 137,840 boxes at this date a year ago.

Some little revival has been experienced in the wagon building trade, and from this, Scotch companies are reaping some benefit. Motherwell Wagon & Rolling Stock Co. has obtained the following contracts: North British railway 230 pairs wheels and axles; Caledonian railway 500 pairs wheels and axles; East Indian railway 100 pairs wheels and axles; Rohilkind and Kumaon railway 300 pairs wheels and axles; Burma railways 200 pairs wheels and axles. It also is to build 250 16-ton mineral wagons for the North British railway, this being the balance of an order for 487 wagons.

German Pig Iron Prices Are Advanced

European Special Service

DUSSELDORF, Germany, Sept. 21.—During the period from Sept. 20 to 30 the following pig iron prices have been fixed: Westphalian Hematite, 30506 marks; ($23.18) Oberhausen; Westphalian Foundry, No. 1, 26524 marks; ($20.16) Oberhausen; Westphalian Foundry, No. 3, 26454 marks ($20.11) Oberhausen; Siegen steel pig iron low in carbon, 29,838 marks; ($22.68) Siegen; Luxembourg Foundry, No. 3, 24756 marks; (19.71) at Luxembourg. At the same time it has been agreed to leave the prices for all

Mark $0.00076

steelworks and rolling mills products unaltered for the remainder of this month.

In consequence of the heavy rise of all prices during the last two weeks, demand has fallen off materially as buyers want some time to get accustomed to such enormous prices. However, there is no doubt that the prices will be increased again materially on Oct. 1, because the fuel prices will then be raised by another 2000 marks ($1.52) per metric ton, and the railway freights will be increased another 100 per cent of the present rates. Also the workmen demand for higher wages and while unskilled men earn today 81 marks per hour ($0.06), they ask as much as 150 marks ($0.11) per hour from Oct. 1.

Fuel remains scarce insofar as good qualities are concerned; the imports of English, Dutch and Saar fuel continue even at the present rates of exchange. However, the deliveries against the Peace Treaty to France, Belgium and Italy are at the rate of only 1,610,000 metric tons per month, compared with 1,725,000 tons per month from July to October, and 1,916,000 tons per month before July 1, this year.

There is no business whatever for export at present rates of exchange, as foreign buyers cannot see any profit in the German prices just now. This may be altered soon as a further decline of the German exchange is expected generally.

Although plants are not receiving any fresh orders neither for inland nor for export, the larger companies still have sufficient old orders on their books to keep them active, but some of the smaller works are forced to decrease their production owing to lack of capital and the suspension of bank credits.

French Active as Competition Falls

European Special Service

PARIS, Sept. 25.—French iron and steel markets are improving. One of the principal causes of this activity is the absence of German competition in the French domestic and export markets. A brisk demand has existed for several weeks for raw materials semifinished products and finished steel for export; consequently the larger steel product are feeling more confident.

In export circles, the dissolution of the Comptoir des Hematites, hematite selling syndicate, has been discussed. Since the war the Comptair des Fontes has never been reorganized and the efforts made in view of re-establishing the Comptoir des Aciers Marchands also have failed. The re-organization of the Comptoir Siderurgique, for semifinished steel, was accomplished under difficulties. Although it is generally agreed that the principle of these sellings syndicates is good, and that the danger of monopolizing the market is averted owing to competition from powerful independent companies and foreign producers, it is believed the organization of the comptoirs needs to be studied in view of present conditions, especially as regards export business.

Franc—$0.075

On the whole the outlook of the French market is favorable and the recent depreciation of the franc helps. The price of metallurgical coke remains fixed at 95 francs ($7.15) a metric ton. Deliveries from the Ruhr continue to be about 80 per cent of the tonnage fixed by the reparations committee, 14,000 tons daily. A certain anxiety is felt in iron and steel circles regarding paragraph 7 of the Lubersac-Stinnes agreement, by which part of the coal to be delivered by Germany as prescribed by the Versailles treaty is to be retroceded for the manufacture of materials which Germany is to deliver to France.

Production of pig iron is about stationary since May. However, the demand is good and prices are firm, averaging from 220 ($16.50) to 230 francs ($17.25) per metric ton although for No. 3 chill cast foundry iron sales have been reported at 215 francs ($16.10). Prices of hematite iron are somewhat unstable since the dissolution of the comptoir, although the average quotation is around 290 francs ($21.75) f. o. b. furnace. Export orders are being received from the United States, Italy and Spain.

Prices for semifinished steel are firm and a considerable number of orders have been booked for various countries. Beams and structural shapes are in demand and the price remains fixed at 475 francs ($35.60). Merchant bars are quoted at from 430 francs ($32.25) to 440 francs ($33) f. o. b. Eastern mill and from 470 francs ($35.25) to 480 francs ($36) f. o. b. western mill. There are many inquiries for shiffler poles owing to numerous new electrical installations. Prices for plates and sheets stiffening. It is reported that inquiries have been received from the United States for light gage sheets.

Galvanized sheets are in good demand. An Eastern mill has quoted 1220 francs ($91.50) per metric ton for 0.6 millimeter gage; 1140 francs ($85.50) for 0.7 billimeter 1120 francs ($84) for 0.8 millimeter 1100 francs $82.50) for 0.9 millimeter and 1060 francs ($79.50) for millimeter gage; all f. o. b. mill.

Belgium's Trade Position Stronger

European Special Service

BRUSSELLS, Sept. 25.—The Belgian iron and steel market appears to be consolidating its position which has become stronger lately. Prices are being adjusted upward and orders are coming in from all quarters. Export business also shows signs of activity. Germany has become a customer, except for plates and galvanized products. Lorraine and Luxemberger are handicapped at the present time by the coke shortage.

However, Belgian producers are meeting with difficulties in their efforts to re-establish themselves on a profit paying basis, as a campaign has been opened by labor for higher wages. The increase in cost of production which would result would considerably reduce profits which are only now beginning to be remunerative after months of stagnation; this tends to show that, atlhough the situation is actually improving, the future is not yet assured. The recent rise in sterling exchange is helping export transactions.

Thirty furnaces are active at present and four stacks are to be blown in this

Franc—$0.07

week, one at Providence, one at Sambra et Moselle, one at Cockerill and one at Ougree-Marihaye. Pig iron production is stationary. A few orders have been obtained from the United States. Inquiries are coming in from Germany, Holland and Denmark. Prices are being adjusted upward.

Semifinished products are firm. Inquiries are received from England for billets. However, most of the output in this product is consumed by producers in their own mills. There is a favorable demand for merchant bars and rods. The price of plates remains firm owing to the steady demand. Medium gage sheets have gone up 10 francs ($0.70) and the lighter gages 25 francs ($1.75) a ton.

The following quotations have been reported: No. 3 foundry pig: 230 francs ($16.10) per metric ton; blooms, 320 francs ($22.40); merchant bars, 425 francs ($29.75); beams, 420 ($29.40) as compared with 390 francs ($27.30) to 400 francs ($28) for export; rods, 500 francs ($35); plates, 480 francs ($33.60) for export; 3 millimeter sheets, 535 francs ($37.45) dometsic price compared to 520 francs ($36.40) for export. Normal conditions have been resumed in the wire nail mills which are endeavoring to make up for the time lost during the strike.

Attributes Accidents to Lack of Instruction

Pittsburgh, Oct. 3.—In presenting his address "100 Per Cent Safety in the Foundry" before the members of the Pittsburgh Foundrymen's association recently, John A. Oartel asserted that possibly 90 per cent of the many thousands injured in industrial accidents each year can trace their condition to carelessness, indifference or lack of instruction in safety. He said that in many cases safety

appliances were provided by the management but are not used because of lack of instruction.

The occasion was the first meeting of the local foundrymen's association following the summer vacation and witnessed the installation of the officers elected last spring as follows: President, Samuel B. Cuthbert, Carnegie Steel Co., Braddock, Pa.; vice president, John W. Guay, Union Steel Casting Co. and William J. Brant, re-elected secretary and treasurer.

Mr. Oartel is chief of the safety bureau of the Carnegie Steel Co. Following his address it was announced that a series of lectures along similar lines is to be presented before the Pittsburgh Foundrymen's association under the auspices of the National Safety council during the period between January and April, 1923.

Furnace Operations

Gain in Pittsburgh District—Steel Mills Less Active

Pittsburgh, Oct. 3.—Operation of blast furnaces continue to gain in this territory but steel mill activity is interfered with by car shortage and other transportation difficulties. Trucking of steel from the mills to connecting points and loading platforms now is being done freely. This condition is aggravated by the inauguration of an embargo against steel and allied lines by the Pennsylvania railroad effective from Oct. 2 to Oct. 11.

The latest blast furnace to go in is the Soho stack of the Jones & Laughlin Steel Co., which has been out of blast for about two years. This furnace was lighted Sept. 28. The Weirton Steel Co., Weirton, W. Va., resumed operations at its banked furnace and the Struthers Furnace Co., is blowing in its furnace at Struthers, O.

The Carnegie Steel Co., continues to keep 36 out of 59 furnaces active but has several ready for coking, including three at Farrell, Pa. One or more of these may go on this week, contingent upon a coke supply coming from the H. C. Frick Coke Co. The Steelworks of the Homestead plant here resumed operations. The Midvale Steel & Ordnance Co., has 6 out of 12 furnaces active. The Pittsburgh Steel Co., has one on but the Pittsburgh Crucible Steel Co., has not been able to put either of its Midland, Pa., furnaces in production. The Shenango Furnace Co. has been able to accumulate enough coke to keep one furnace going.

Sheet and tin mill operations lost between 10 and 15 per cent during the the past week. Other finishing mills likewise are suffering from a lack of raw material and an inability to move their finished products except by trucks or railroads other than the Pennsylvania.

Chicago Output Steady

Chicago, Oct. 3.—Operation of steel mills is practically unchanged, with the Illinois Steel Co. at 70 per cent, with 15 blast furnace stacks in operation. Additions are expected within the present week. Fuel conditions are improving slowly and supplies are not sufficiently large yet to allow more than cautious additions. Inland Steel Co. has blown in its third blast furnace stack but this addition to its pig iron production will not materially increase its steel output for some time, as it has been using cold iron from stock and the latter has been exhausted, the new direct metal merely replacing this for the time being. Steel production is being continued at about 65 per cent of normal output as before.

Carriers Are Deterrent to Valley Production

Youngstown, O., Oct. 3.—As a result of a shortage of carriers sheet mill operations in the Mahoning valley this week have been reduced. Approximately 20,000 tons of sheets are piled on the floors of various mills in this district for lack of shipping facilities and the resultant congestion has reduced rolling schedules to a 91 per cent basis instead of 98 per cent basis a week ago.

Steelworks operation continues at 88 per cent, the same as one week ago with 45 of the 51 independent open hearths active. The Republic Iron & Steel Co., the Youngstown Sheet & Tube Co. and the Brier Hill Steel Co. each have 11 units active; the Trumbull Steel Co. seven; and the Sharon Steel Hoop Co. five.

Pipe mills are operating at 88 per cent representing 15 of the 17 butt and lapweld furnaces. Miscellaneous operation, including 10 pipe mills, one bar mill, and the rod, wire and bessemer departments at the Youngstown Sheet & Tube Co.; four finishing mills, the bessemer department and five pipe mills at the Republic Iron & Steel Co.; two plate mills at the Brier Hill Steel Co.; and 19 tin mills and the hot and cold-rolled strip departments at the Trumbull Steel Co. The Struthers Furnace Co. blew in its stack today.

Steel Scrap in Demand

(*Concluded from Page 896*)

pected to be uniformly high. The Pennsylvania railroad's eastern list approximates 20,000 tons with smaller lists from other districts. Lists from the New York Central and Erie railroads specify no tonnages. The Weirton Steel Co. is buying blast furnace turnings. Lately $18 has been obtained on shovel turnings, axle turnings likewise advancing 50 cents.

The Pittsburgh & Lake Erie railroad has placed an order for the complete dismantling of 500 steel gondola cars. After the cars are dismantled the steel is cut up and loaded on cars for shipment and sold as scrap steel. Work on this order has already been started.

Has Not Hurt Market

Birmingham, Ala., Oct. 2.—Some lagging in certain grades market has not yet affected the general scrap market which remains more active. Foundry interests which had abandoned scrap for a while are coming back into the market and considerable tonnage has been purchased. Yards are well supplied and those in position to assort and prepare scrap are keeping a large force of men at work, in anticipation of good business. Consumers and dealers in Chattanooga, Knoxville and other places in what might be termed the Birmingham territory, made some purchases last week. Heavy melting steel is still held by dealers at $20 with the larger consumer in this district offering only $15. No. 1 cast and stove plate are active with high prices obtaining. Other grades are holding firm.

Decline to Sell Short

Philadelphia, Oct. 3.—The scrap demand is active but actual business is lagging. Dealers are averse to selling, due to the advancing market. Dealers are abandoning the policy of selling short, due to the fact on much recent business their profits were wiped out by the prices they paid to fill contracts they are holding. Stocks are tight. One eastern consumer had to advance $2 to buy several thousand tons of turnings, paying $17 delivered. Considerable business involving various grades now is under negotiation. It is expected high prices will be paid.

Market Is Firm

Cleveland, Oct. 3.—While scrap prices are unchanged from last week's quotations, the market is firm. Little tonnage of consequence is moving due to holding up of shipments by purchasers, the scarcity of cars and general tightening of embargoes. Some consumers, however, still seek scrap, chiefly heavy melting steel and are receiving all contracts tonnage that are now being offered.

Embargoes Slow Trading

New York, Oct. 3.—Substantial demand prevails for heavy melting steel, cast scrap and borings and turnings, but railroad embargoes are causing sellers considerable difficulty in making shipments, especially into the Pittsburgh district. The embargo put into effect yesterday by the Pennsylvania on all materials other than food for shipment west of Altoona, Pa., has done much to complicate the situation. With the exception of stove plate, which is now being quoted $14.50 to $15, all grades are unchanged.

All Grades Advanced

Cincinnati, Oct. 3.—Advances ranging from $1 to $2 a ton have been made in all scrap grades. Under an increasing spot demand and noticably better inquiry the market is strong. Bookings during the past week have been large, steel grades, led by heavy melting, being under particularly good demand. Local consumers have not come into the market to any considerable extent but outside buying is gradually on the increase. Pipe manufacturers are taking considerable tonnage and sales are being made to manufacturers who specialize in the production of brake shoes. Deliveries are being made on long delayed orders, dealers reporting that more headway has been made in the last 10 days in clearing their books than at any time since the railroad strike began, but sufficient cars to meet their requirements are by no means being supplied.

War Scare Causes Fluctuations

Tension Abroad Reflected in Movements of Financial and Speculative Domestic Markets—Removal of Fear of Conflict Causes Stocks to Rise—Trade Outlook Continues Highly Favorable

BY JOHN W. HILL, FINANCIAL EDITOR

RECENT movements in financial and speculative commodity markets have been under the spell of the war tension abroad. At the height of the scare, stocks broke sharply, cotton declined and wheat advanced. This was in accordance with the usual reaction of the markets to war news. Consequently when the present week opened with every indication that actual conflict would be averted, there were recoveries on the stock market and in cotton, and somewhat lower prices for wheat.

While the Near Eastern developments plainly were the occasion for the share and wheat fluctuations, other factors entered into the situation. The price of wheat had fallen about 20 cents a bushel since July to a level below $1 a bushel. At the farms, the price was much less than this.

The prospects of war probably brought a realization of the fact that the world wheat crop is 40,000,000 bushels less than it was in 1921; that Europe's crop is 138,000,000 bushels less; and that the world's carryover is some 60,000,000 bushels smaller. These considerations are sufficient to justify firmer values, regardless of war developments. The low price of wheat has had an unfavorable effect upon the purchasing power and sentiment in the agricutural sections and the recovery if it is at least partly held, is a constructive event of great significance for general business.

In the stock market the recent reaction most likely was a temporary reversal and readjustment of values, accentuated by war news, following the prolonged and extended advance. The decline did not mean that the stock market has definitely changed its major trend, which has been upward in anticipation of prosperous times for business in the remaining months of this year and in 1923. In fact all fundamentals continue to point unmistakably to a steady expansion in business, the only immediate obstacle to which is the car shortage threat.

The stiffening of money rates and the decline in bond prices have a direct bearing on business conditions. For many months commercial loans of banks have contracted as business diminished. At the same time banks have employed their mounting idle funds in investments. The rise of commercial loan rates is interpreted to mean that business expansion is beginning to create a growing demand for credit. This will necessitate banks converting their investment assets into more liquid form for commercial use. The recent decline in bonds may reflect selling for this purpose. Credit facilities are ample and no stringency is probable for many months.

The recent decline in British sterling exchange has partly resulted from the war news and partly from the preparations to meet the interest on the American debt and to pay for American food imports. For the first time since 1917 Canadian exchange is at par.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One month ago	One year ago	1913
Business failures	380	410	376	369	300
Cash Ratio Fed. Res. system	78.4	78.3	79.6	69.0	.....
Loan rate, 4-6 months, N. Y. (per cent)	4¼-4½	4-4¼	4	5¾	5¼-5½
Aver. 20 Ind'l. shares	$93.45	$94.71	$97.42	$68.13	$80.79
Aver. 20 Rail shares	$89.76	$91.19	$92.11	$74.01	$107.33
Aver. 40 bonds	$81.26	$82.44	$82.36	$71.50	$93.00
Car loadings (week ended Sept. 16)	945,919	893,844	856,219	841,300	*1,006,000
Bank debits 165 cities (000 omitted)	$8,224,263	$9,413,296	$7,218,616	$7,467,300	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	Oct. 2 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.39½	$4.41⅝	$4.47	$3.72½
Francs	19.3c	7.57½c	7.61¼c	7.83c	7.09c
Lira	19.3c	4.27c	4.23c	4.39c	3.98½c
Marks	23.8c	0.05⅝c	0.07⅛c	0.07¾c	0.79c

MONTHLY COMPARISON

	August	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$322,007,000	$350,081,000	$221,000,000	$71,450,000
Business failures: Number	1714	1753	1562	1336
Liabilities	$40,279,718	$40,101,313	$42,904,409	$22,723,000
Excess of exports	$31,000,000	$54,000,000	$172,119,000	$54,406,000
Excess of gold imports	$18,136,355	$42,341,613	$84,229,902	*$630,716
Bureau of Labor Price Index	155	155	142	100
Bradstreet's Price Index	131	130.9	120.2	100
Economist's British Price Index	4257	4396	4819	2717
Cost of Living Index	154.5	155.6	162.0	100
New incorporations	$646,605,000	$634,259,000	$580,141,000	$172,301,000
Railroad net earnings	†$69,239,000	$76,000,000	$69,298,000	$59,900,000

†July. *Monthly average export excess.

The Business Trend

October 5, 1922

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Business expansion continues steadily; only immediate probable obstacle is freight congestion this fall; prices remain firm in many lines but fear of dangerous inflation is subsiding; rise of wheat helps farmer purchasing power.

INDUSTRIAL ACTIVITY—Operations in iron and steel and numerous other industries increasing or holding steady; soft coal output above consumption; car shortage may restrict activities.

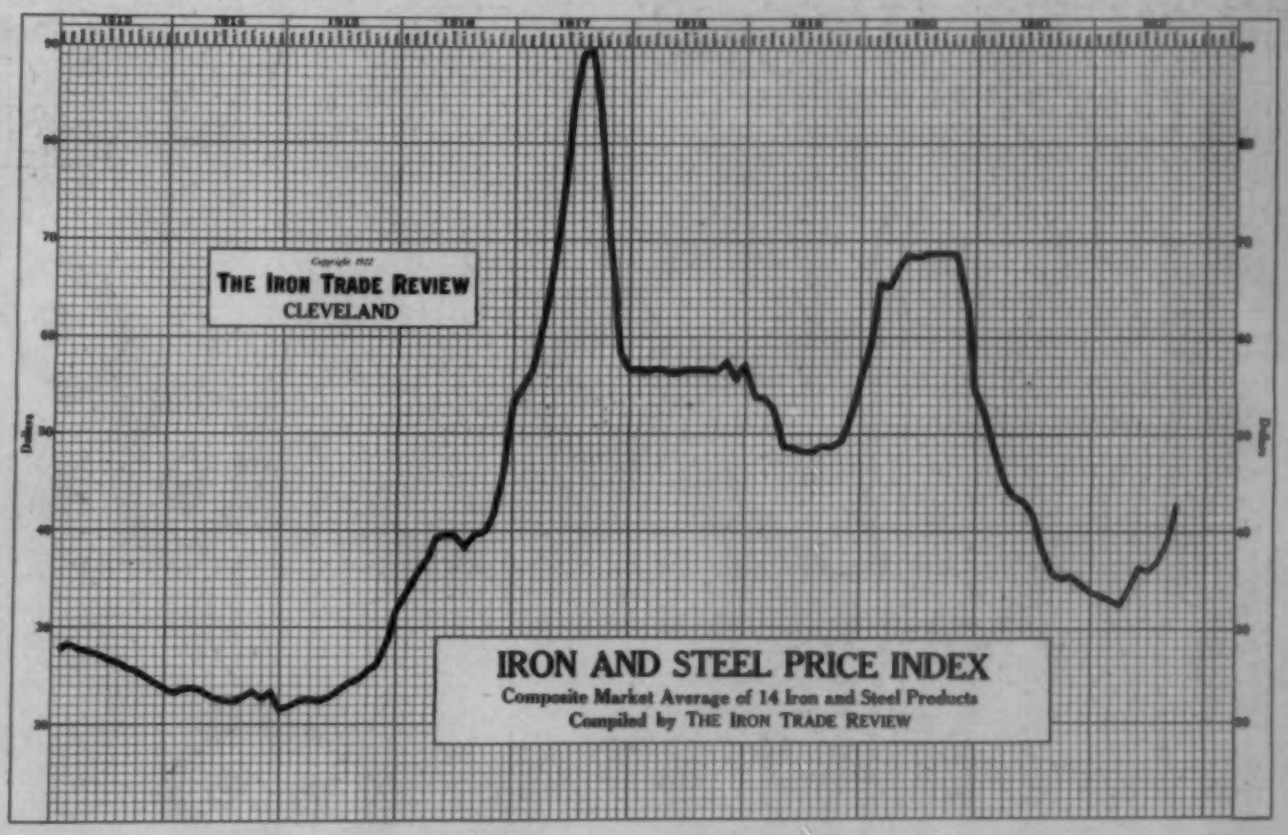
FREIGHT TRAFFIC—Car loadings now near peak of 1920 high records; for first time since November 1920 freight car shortages re-appear; roads embargo.

STATE OF CREDIT—Autumn demands stiffen money market; commercial loan rates at New York now 4½ to 4¾ per cent; bank resources large and no credit strain threatens.

RAIL EARNINGS—Reports of August operating results of leading roads indicate that earnings were less affected by strike than was expected; present traffic indicates large earnings this fall.

STEEL PRICES—Iron Trade Review Iron and Steel Price Index continues to rise; now stands 68 per cent above 1913; was 25 per cent above in March; 35 per cent rise in 1922.

STRUCTURAL AWARDS—Larger activity in heavy building reflected in better orders at structural shops; August activity 65.2 per cent of capacity.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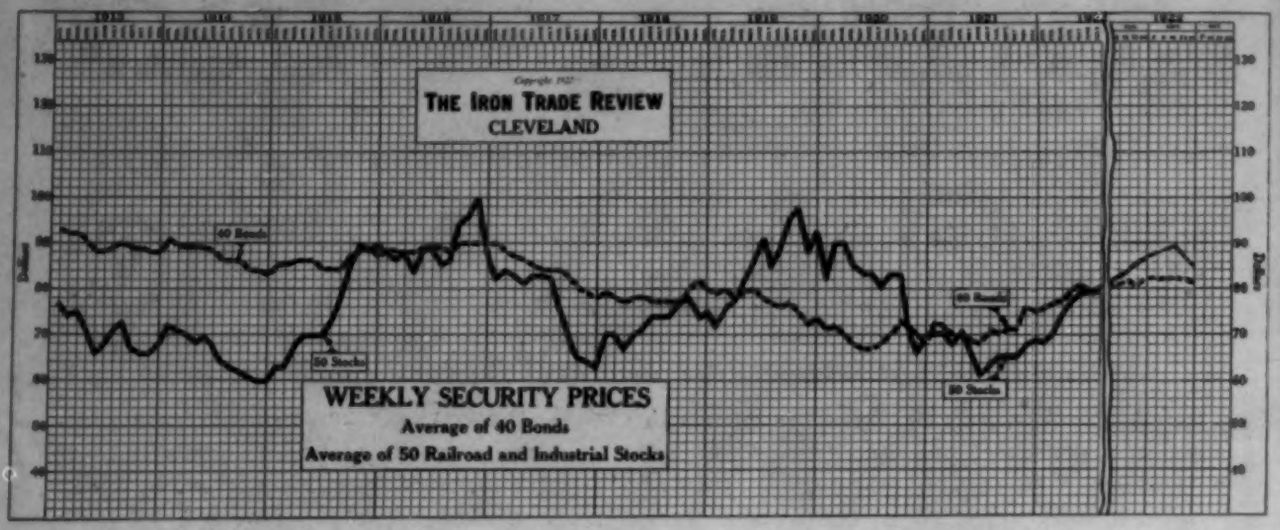
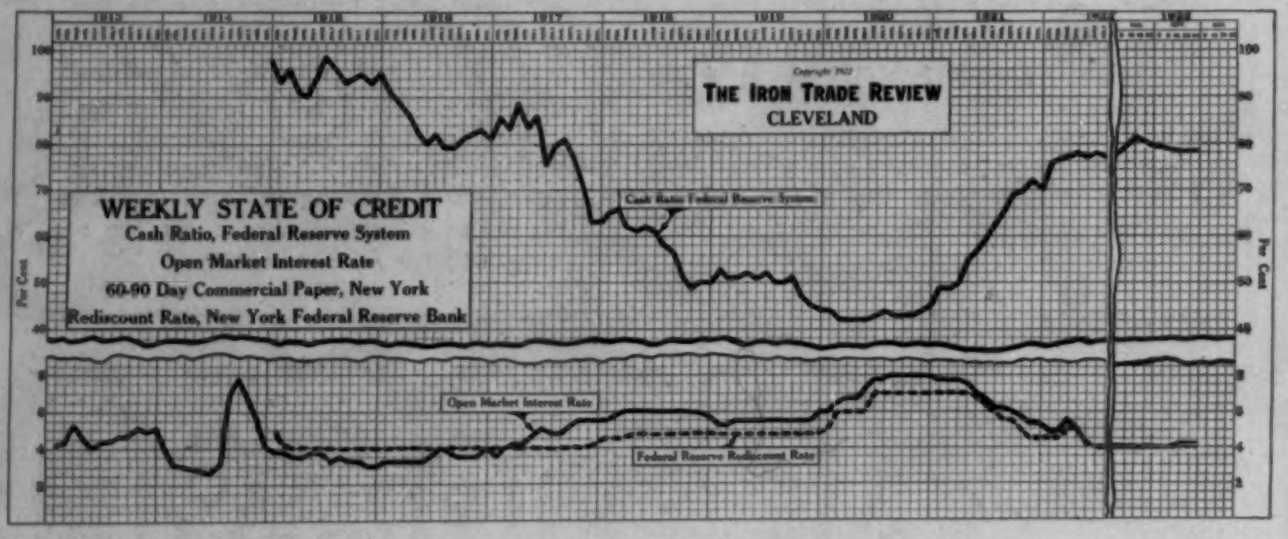
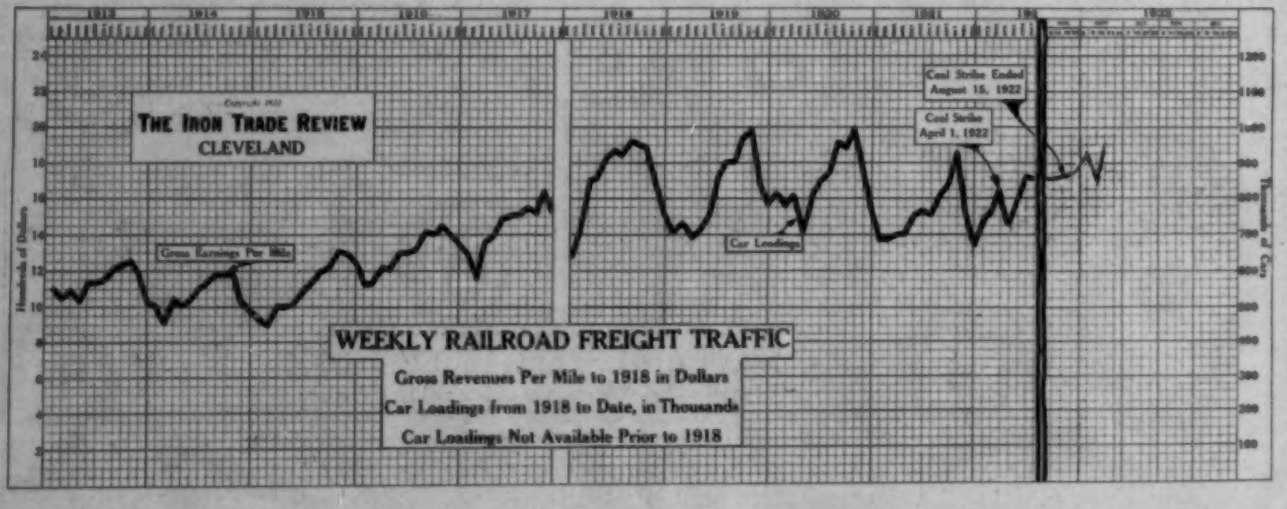
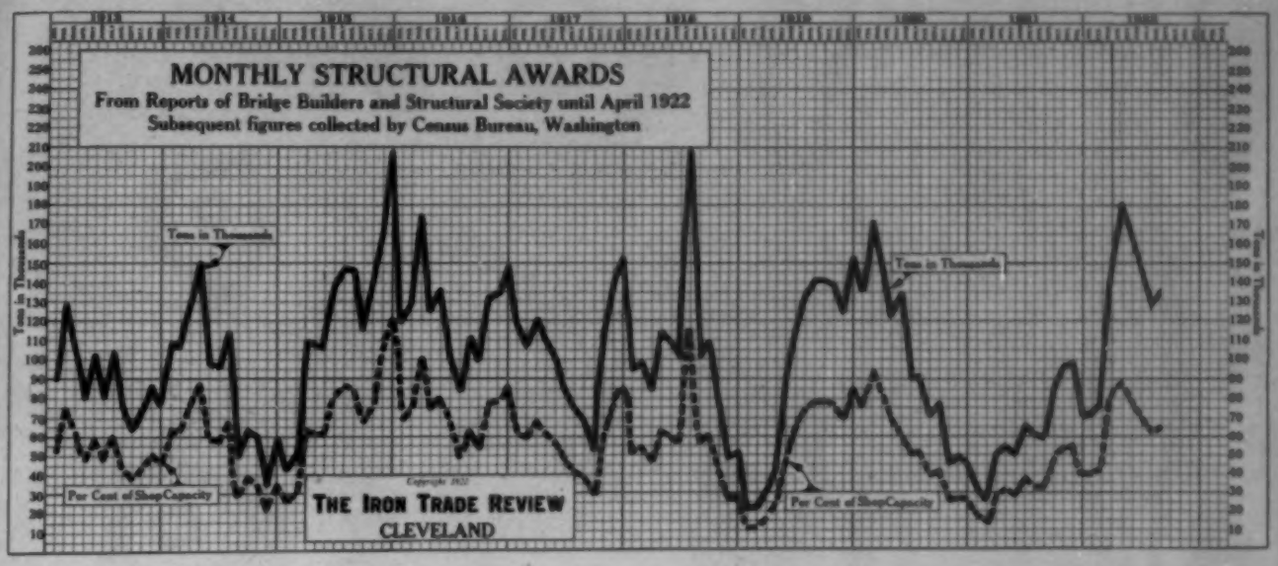
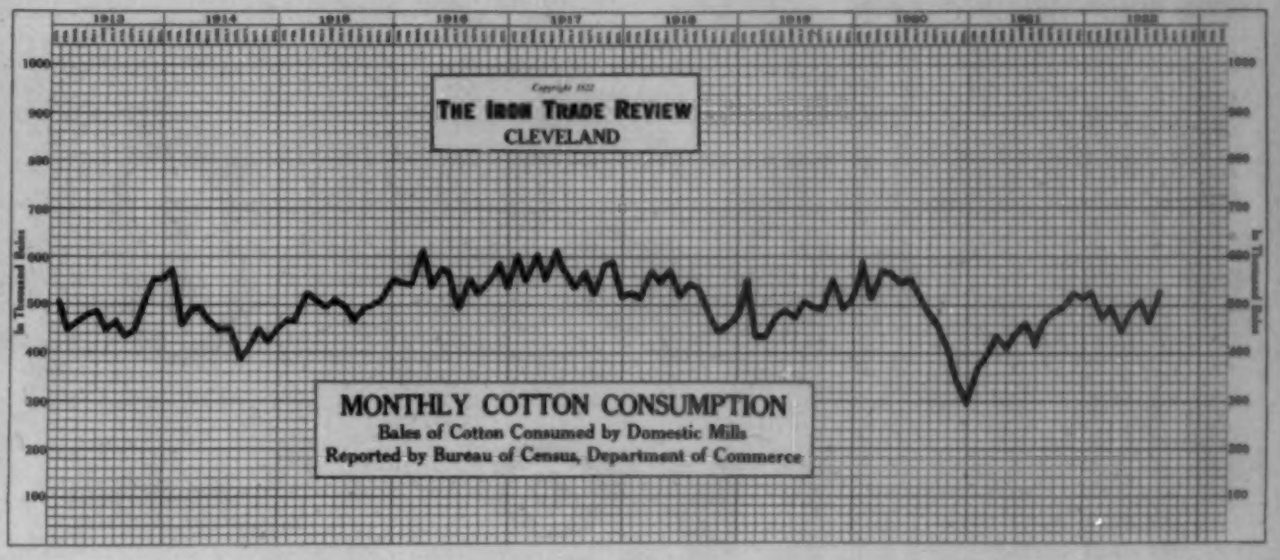
THE IRON TRADE REVIEW
CLEVELAND
IRON AND STEEL PRICE INDEX
Composite Market Average of 14 Iron and Steel Products
Compiled by THE IRON TRADE REVIEW

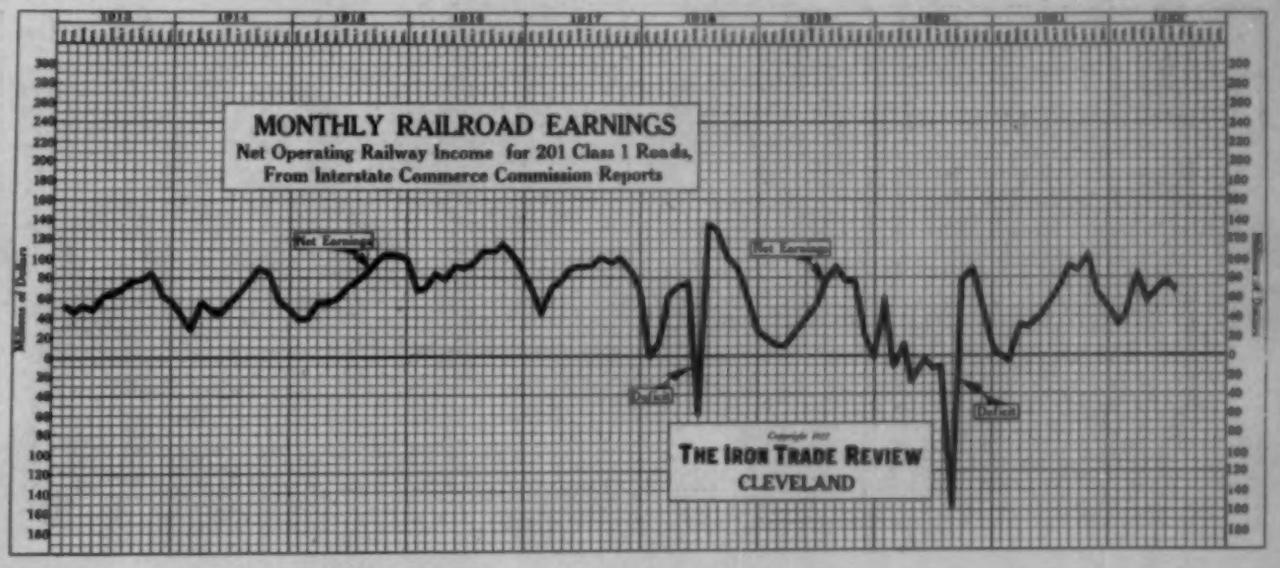

THE IRON TRADE REVIEW
CLEVELAND
40 Bonds
50 Stocks
WEEKLY SECURITY PRICES
Average of 40 Bonds
Average of 50 Railroad and Industrial Stocks


THE IRON TRADE REVIEW
CLEVELAND
WEEKLY STATE OF CREDIT
Cash Ratio, Federal Reserve System
Open Market Interest Rate
60-90 Day Commercial Paper, New York
Rediscount Rate, New York Federal Reserve Bank
Cash Ratio Federal Reserve System
Open Market Interest Rate
Federal Reserve Rediscount Rate
Per Cent


THE IRON TRADE REVIEW
CLEVELAND
Coal Strike Ended August 15, 1922
Coal Strike April 1, 1922
Gross Earnings Per Mile
Car Loadings
WEEKLY RAILROAD FREIGHT TRAFFIC
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1918 to Date, in Thousands
Car Loadings Not Available Prior to 1918
Hundreds of Dollars
Thousands of Cars


MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders and Structural Society until April 1922
Subsequent figures collected by Census Bureau, Washington
Tons in Thousands
Per Cent of Shop Capacity
THE IRON TRADE REVIEW
CLEVELAND


THE IRON TRADE REVIEW
CLEVELAND
MONTHLY COTTON CONSUMPTION
Bales of Cotton Consumed by Domestic Mills
Reported by Bureau of Census, Department of Commerce


MONTHLY RAILROAD EARNINGS
Net Operating Railway Income for 201 Class 1 Roads,
From Interstate Commerce Commission Reports
Net Earnings
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THE IRON TRADE REVIEW
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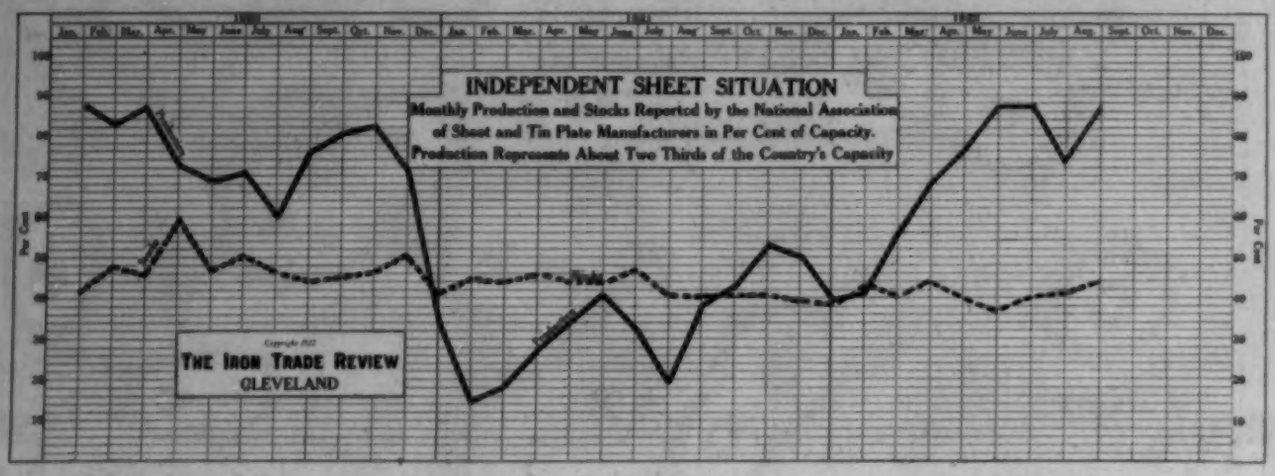
INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by the National Association of Sheet and Tin Plate Manufacturers in Per Cent of Capacity.
Production Represents About Two Thirds of the Country's Capacity
Per Cent
Per Cent
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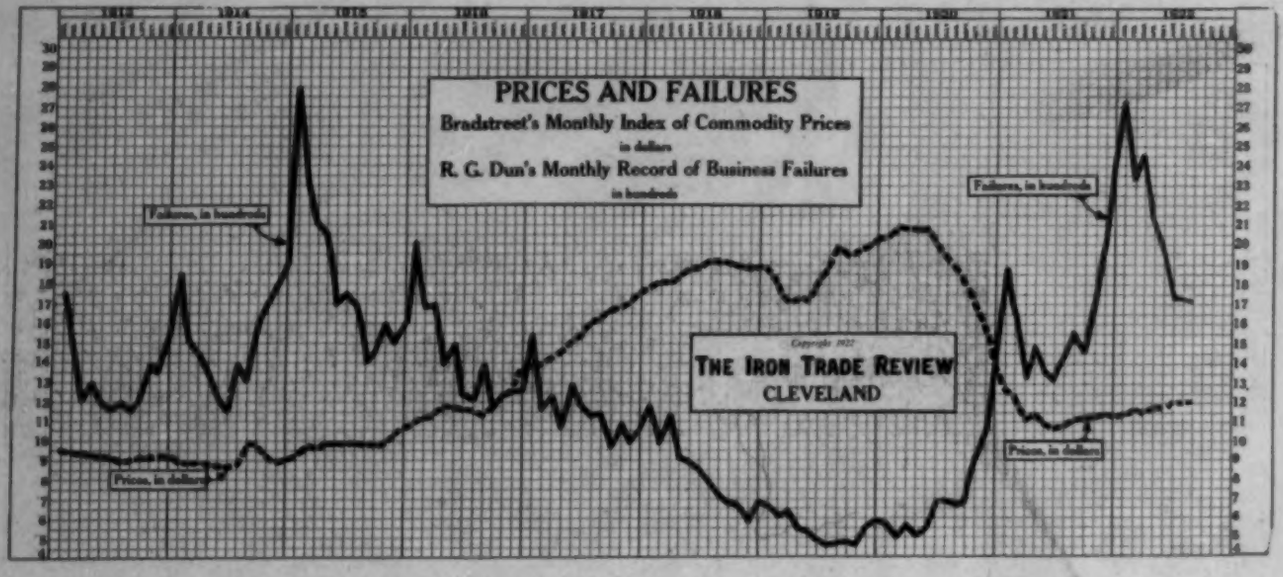
PRICES AND FAILURES
Bradstreet's Monthly Index of Commodity Prices
in dollars
R. G. Dun's Monthly Record of Business Failures
in hundreds
Failures, in hundreds
Prices, in dollars
Failures, in hundreds
Prices, in dollars
THE IRON TRADE REVIEW
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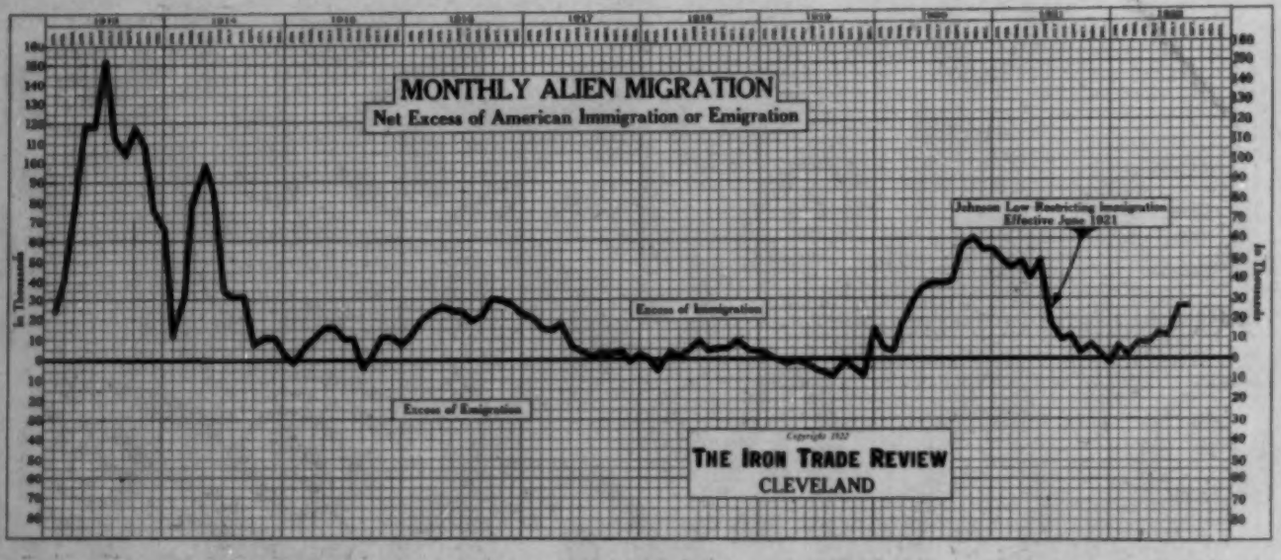
MONTHLY ALIEN MIGRATION
Net Excess of American Immigration or Emigration
In Thousands
In Thousands
Johnson Law Restricting Immigration Effective June 1921
Excess of Immigration
Excess of Emigration
THE IRON TRADE REVIEW
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Heat Treating Changes Volume

Eleven Experiments Conducted on Nickel-Chromium Steels Indicate Expansion and Contraction Is Related Directly to Temperature Alterations—Summary Shows Results of Subjecting Metal to Various Conditions

BY LESLIE AITCHISON AND G. R. WOODVINE

IN CONNECTION with the heat treatment of steel, the alterations of volume that take place during the heating and cooling of the metal appear to be of importance. The author's intention has been to make some investigation of these critical volume changes, particularly in respect to the more complex steels. The first tests have been carried out upon air hardening nickel-chromium steels. The physical changes undergone at various tempering temperatures have formed a considerable part of the investigations. Volume changes were one branch of the work. Having gone so far it was desirable that the examination of this type of steel should be continued, and as a result the work was extended.

Results obtained are of sufficient interest to warrant their publication before the entire scheme of work has been brought to completion, and also possibly before an attempt is made to give a complete explanation of the observed phenomena.

The apparatus can be seen in the sectional diagram in Fig. 1. Ball joints were used to convey the pressure from the specimen to the lead block at one end and to the diaphragm at the other end. This precaution insured axial and regular pressure upon the diaphragm and obviated some difficulties that were met with when the ball was not employed.

Care has been exercised to observe and correct for the effect of changes of temperature in the atmosphere of the laboratory during the experiments. This was necessary with regard to the colored water used as an indicator in the manometer. The effect of this factor has been included in the observations set out herein and the curves have been suitably corrected.

The chemical composition of the steel employed in the experiments was as follows:

	Per cent
Carbon	0.33
Silicon	0.18
Manganese	0.62
Sulphur	0.036
Phosphorus	0.038
Nickel	4.64
Chromium	1.53

The steel had been rolled to round bars, some to 1 inch and some to ¾ inch diameter. The bulk of the experiments were made upon the ¾-inch round bars, and only a few specimens were taken from the 1-inch round bars. The original diameter of the bar made no difference to the observed results. The rate of heating employed throughout the experiments was kept as nearly constant as possible. In the different experiments the variation from the customary rate was not more than 10 per cent either way. The general rates of heating and cooling within the various ranges of temperature between atmospheric and 800 degrees Cent. follow:

Temperature range Degrees Cent.	Rate in degrees Cent. per minute Heating	Cooling
10-100	6	½
100-200	5	2
200-300	5	3
300-400	5	3½
400-500	5	3
500-600	4	2½
600-700	3	2½
700-800	2½	2½

An inert atmosphere was maintained within the tube of the dilatometer during the entire heating and cooling. Care was taken to insure that the experimental results were reliable. The observations were repeated frequently, and wherever doubt arose the experiments were repeated a sufficient number of times to prove that the conclusion reached was accurate.

A difficulty encountered in regard to work upon an air hardening nickel-chromium steel was the selection of a condition of the steel that could be regarded as standard, and which therefore could be used as a basis of comparison in the various experiments. As a standard condition a material was selected that had been cooled in the air under precise conditions. Prior to any experiment, there-

From a paper presented at the meeting of the Iron and Steel institute, held in York, England, Sept. 5-6.

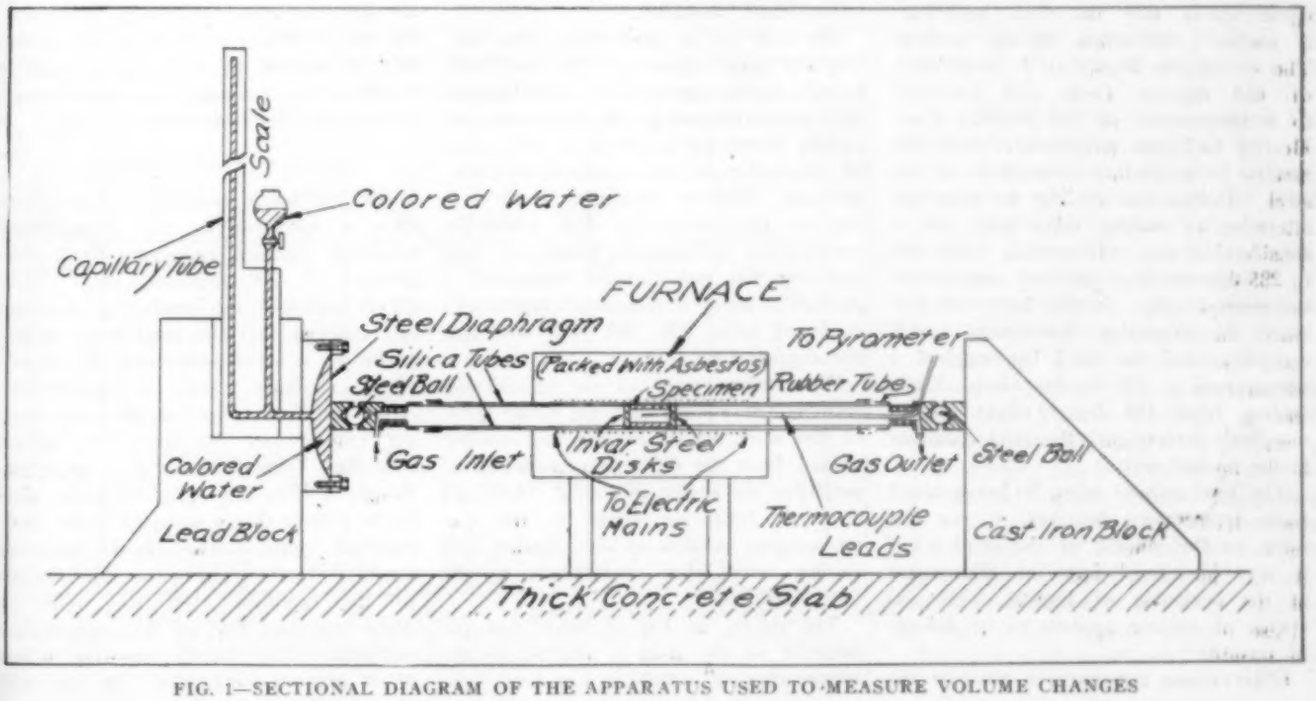


FIG. 1—SECTIONAL DIAGRAM OF THE APPARATUS USED TO MEASURE VOLUME CHANGES

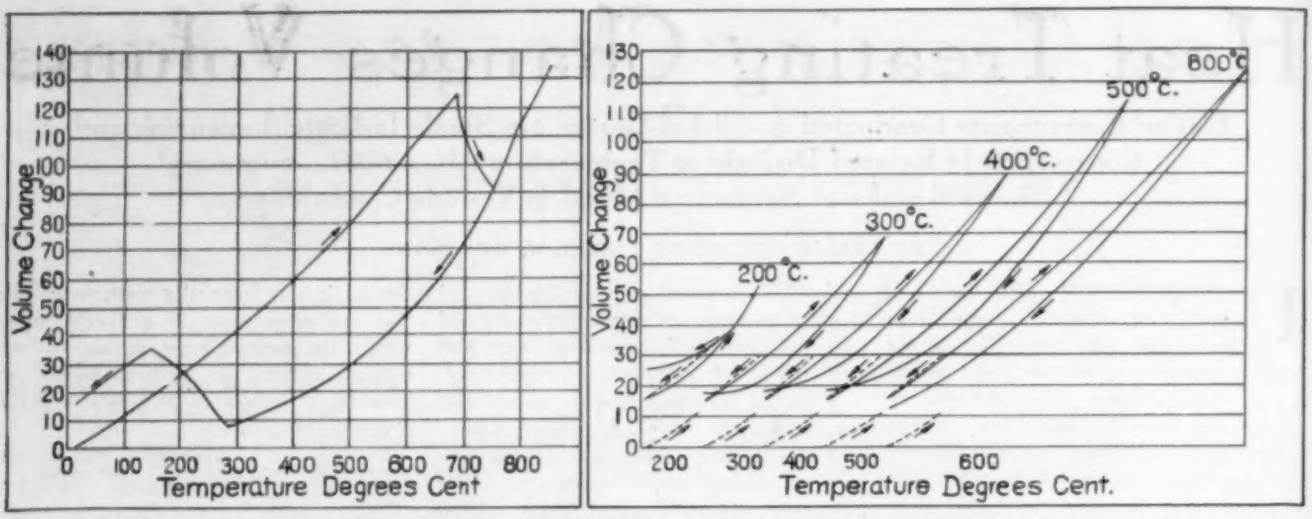


FIG. 2—(LEFT) VOLUME CHANGES PRODUCED BY HEATING STANDARD SPECIMENS TO 850 DEGREES CENT. (RIGHT) CURVE SHOWING CHANGES PRODUCED BY HEATING TO VARIOUS TEMPERATURES. THE DOTTED CURVE INDICATES BOTTOM PORTIONS OF HEATING AND COOLING CURVE OF THE SEMISTANDARD TREATMENT OF EACH SPECIMEN

fore, the specimen that was to be employed was heated to a temperature of 830 degrees Cent. in a muffle furnace and then removed from the furnace and allowed to cool to atmospheric temperature in the air. Steps, of course, were taken to avoid oxidation. This condition, that is, air cooling from 830 degrees Cent., will be referred to hereafter as the standard condition of the steel.

Steel Shows a Contraction

In the first experiment a specimen in the standard condition was introduced into the dilatometer, heated to a temperature of 850 degrees Cent., and allowed to cool down to atmospheric temperature. The relationship between the volume and the temperature of the steel throughout the heating and cooling in the dilatometer is shown by the curve in Fig. 2. The curve shows that the steel undergoes a marked contraction during heating. The contraction begins at a temperature of 685 degrees Cent. and continues to a temperature of 745 degreed Cent. Heating to higher temperatures than this results in a further expansion of the steel. During the cooling no abnormal alteration of volume takes place for a considerable time. In cooling from 850 to 285 degrees Cent. the steel contracts in the normal way. At the latter temperature an expansion commences which continues until the steel has reached a temperature of 150 degrees Cent. When cooling from 150 degrees Cent. to atmospheric temperature the steel contracts in the normal way.

The final volume when it has attained room temperature however, is not the same as the volume of the steel when it was introduced into the dilatometer at the beginning of heating. The increase of volume appears to be definite in quantity.

Observations necessary to produce the fundamental curve were repeated a number of times, a specimen in the standard condition being taken initially in each instance. The form of the curve as regards the temperatures of critical expansion and critical contraction, and also the difference in the volume of the steel before and after the experiment, practically were identical in each test. Values were so nearly the same that it is impossible to show the different curves on the same diagram, as they are almost superimposed.

As the steel in many of the succeeding experiments, after having been put into standard condition, was treated as in the foregoing experiment, it is convenient to refer to steel that has undergone the standard treatment and then been heated in the dilatometer to 850 degrees Cent. and cooled therein to atmospheric temperature, as being in the semistandard condition.

The next set of experiments was carried out upon specimens that had been brought to the semistandard condition and then were reheated in the dilatometer to various tempering temperatures and cooled thereafter to the atmospheric temperature. Separate specimens were used for the experiments at each tempering temperature, and prior to tempering, each specimen was put into the semistandard state. The different reheating temperatures employed were 200, 300, 400, 500 and 600 degrees Cent.

Observations taken of the relationship between the volume and the temperature of the steel during heating and cooling to and from the different reheating temperatures are shown in Fig. 2. Attached to each tempering curve is the low temperature portion of the heating and cooling curve that corresponds to the first experiment.

The curves in Fig. 2 show that the behavior of the steel is affected by the temperature at which it has been tempered. Tempering at 200 degrees Cent. has produced a further expansion of the steel. Heating to 300 degrees Cent. has produced a smaller expansion, much the same result being produced by tempering at 400 and 500 degrees Cent. Tempering at 500 degrees Cent. has resulted in the contraction of the specimen. In Fig. 3 the relationship between the tempering temperature and the volume of the specimen after being subject to different temperatures is shown.

The effects produced by reheating at the different temperatures suggested that is would be well to investigate whether additional operations at various temperatures could bring about more complete changes in the steel. Experiments, therefore, were made by taking a steel in the semistandard condition, heating it in the dilatometer to the selected temperatures, allowing it to cool to room temperature, and then repeating the heating and cooling such a number of times as was necessary to produce in the specimen such a condition that it occupies the same volume before and after tempering.

First Test at 200 Degrees Cent

The first set of observations was made upon a specimen in the semistandard condition, reheated repeatedly to a temperature of 200 degrees Cent. The curves indicated the number of heatings and coolings that the steel must undergo before it attains what may be regarded as a stable volume is considerable. After the first tempering the steel does not expand any further. The second reheating brings about a contraction, though it does not bring back the steel to the volume that it occupied in the semistandard state. The third reheating causes a further contraction, the volume of the specimen after this reheating being less than that of the semistandard specimen. The fourth reheating brings about greater contraction. At the fifth

reheating the volume before and after reheating is the same. The specimen was heated to 200 degrees Cent. and cooled to atmospheric temperature twice more to insure no further contraction took place. The result therefore of the repeated heatings to 200 degrees Cent. is that the steel has contracted by a definite amount. In Fig. 4 a curve is set out showing the volume at atmospheric temperature of the steel at different stages.

A similar series of experiments were then carried out with a semistandard specimen repeatedly reheated to 300 degrees Cent. instead of 200 degrees Cent. Briefly the results obtained by reheating repeatedly to 300 degrees Cent. were similar to those obtained by frequent heatings to 200 degrees Cent. The initial expansion of the steel is followed by a contraction which increases in magnitude until the sixth time of reheating. When heated to 300 degrees Cent. and cooled for the sixth time the volume before and after heating is the same. The seventh reheating confirms this constant volume condition. However, the total contraction produced by repeated heating and cooling to and from 300 degrees Cent. is greater than the total contraction produced by repeated heating to 200 degrees Cent.

The next set of tests was made on a specimen heated frequently to 400 degrees Cent. The general tendency of the curves is similar to those obtained from the steel by reheating it to 300 degrees Cent. The constant volume conditions is again attained after the sixth heating, while the total contraction produced by repeated heatings and coolings at 400 degrees Cent. is the same in amount as that produced by repeatedly heating and cooling to and from 300 degrees Cent.

The specimen heated to 500 degrees Cent. expanded at the first heating and again at the second heating. After the third heating the volume before and after heating was the same. During the fourth, fifth and sixth heatings and coolings the specimen contracted, while the seventh heating and cooling appeared to have brought about the stable condition. This was confirmed by the eighth heating and cooling. Once again the total contraction produced by the repeated heatings shows that the difference in volume between the steel in the semistandard condition and after frequent reheatings at 500 degrees Cent. is the same as the corresponding difference between the specimen heated frequently to 300 degrees Cent. and the specimen reheated frequently to 400 degrees Cent.

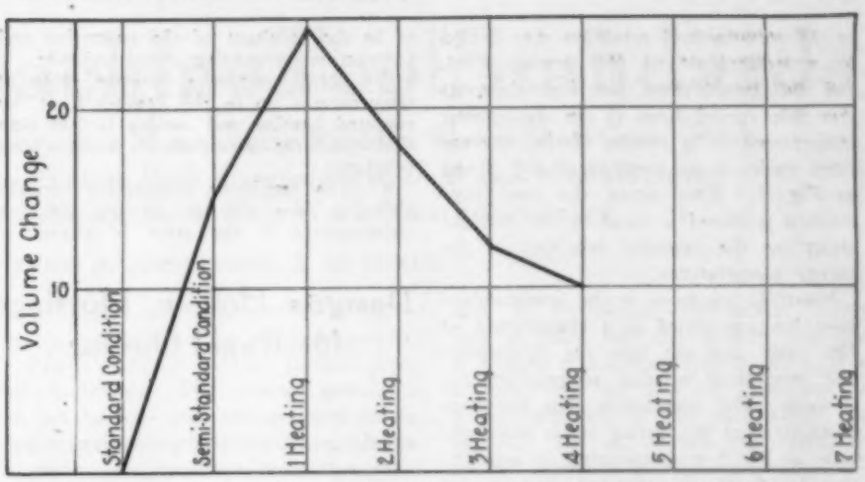


FIG. 4—SHOWS VOLUME OF SPECIMEN AFTER REPEATED HEATINGS TO 200 DEGREES CENT.

Stable Condition Is Reached

The final specimen was submitted to repeated heatings to 600 degrees Cent. It was shown previously that on first reheating to this temperature the specimen did not expand but contracted. A greater contraction occurs during the second heating and cooling, while after the third heating and cooling the specimen has apparently attained a stable volume condition. The total contraction produced by the repeated heating to 600 degrees Cent. is the same as the total contraction produced by heating repeatedly to 300, 400 and 500 degrees Cent.

Experiments on the effect of reheating made it evident that reheating to a temperature as low as 200 degrees Cent. was bringing about a change of volume in the steel. Therefore an experiment was made by reheating to a lower temperature.

A specimen of the steel in the semistandard condition was heated repeatedly to a temperature of 100 degrees Cent. Results indicate that, while the steel undergoes an initial expansion, this is followed by a contraction which increases in magnitude, until after the sixth heating the steel comes to what appears to be a stable volume condition. The total contraction produced by the repeated heatings to 100 degrees Cent. is the same as that produced by the repeated heatings to 200 degrees Cent., the total change of volume brought about by heating at either of these two temperatures being less than that produced by heating to 300, 400, 500 or 600 degrees Cent.

The foregoing experiments suggest the alterations in volume produced by frequent reheatings and subsequent coolings are additive, and might be brought about in one operation if sufficient time at the reheating temperature was allowed. Specimens, therefore, were reheated to different temperatures and maintained at that temperature for a considerable period.

A specimen in the semistandard condition was heated to a temperature of 200 degrees Cent., and maintained at that temperature for six days. The net effect of the heating has been to bring about a contraction being the same as that which has been produced by repeated heatings at temperatures of 300, 400, 500 and 600 degrees Cent. The contraction is greater than the total brought about by repeated heatings to 200 degrees Cent.

As a further experiment a specimen

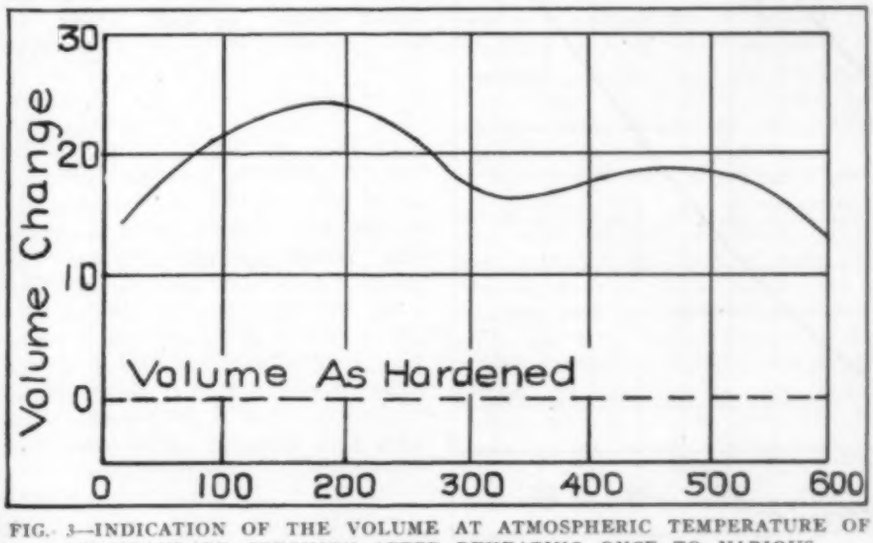


FIG. 3—INDICATION OF THE VOLUME AT ATMOSPHERIC TEMPERATURE OF SEMISTANDARD SPECIMEN AFTER REHEATING ONCE TO VARIOUS TEMPERATURES

in the semistandard condition was heated to a temperature of 600 degrees Cent. and maintained there for four days. It was than cooled down to the atmospheric temperature. The results of the observations made in the experiment are shown in Fig. 5. Here again, the total contraction produced is equal to that brought about by the repeated heatings at the higher temperatures.

Finally a specimen in the semistandard condition was tested at a temperature of 100 Cent. and put into the dilatometer and maintained at that temperature for a week. The contraction that has been brought about by heating for a prolonged time at this low temperature is equal to that produced by repeated heatings of the steel to the higher values of tempering temperature, and that it is markedly greater than the net contraction produced by repeated heatings and coolings to 100 degrees Cent.

The experiments made up to the present may be summarized as follows:

1. The expansion that should be produced at the critical range during the cooling from the hardening temperature is not completed during the cooling employed.
2. Reheating to quite low temperatures induces a further expansion.
3. Further reheating to low temperatures brings about a contraction.
4. Prolonged heating at low temperatures induces still further contraction.
5. Reheating to intermediate temperatures, 300 degrees Cent. to 500 degrees Cent., induces a similar initial expansion and then a contraction.
6. Reheating to 600 degrees Cent., induces a contraction.
7. The smaller initial expansion at the intermediate temperatures is likely to be the resultant of the expansion and contraction proceeding simultaneously.
8. Total contraction brought about at temperatures up to 200 degrees Cent. by repeated heating and cooling is less than that similarly produced at higher temperatures.
9. The maximum contraction brought about in any way at all the different temperatures is the same in amount.

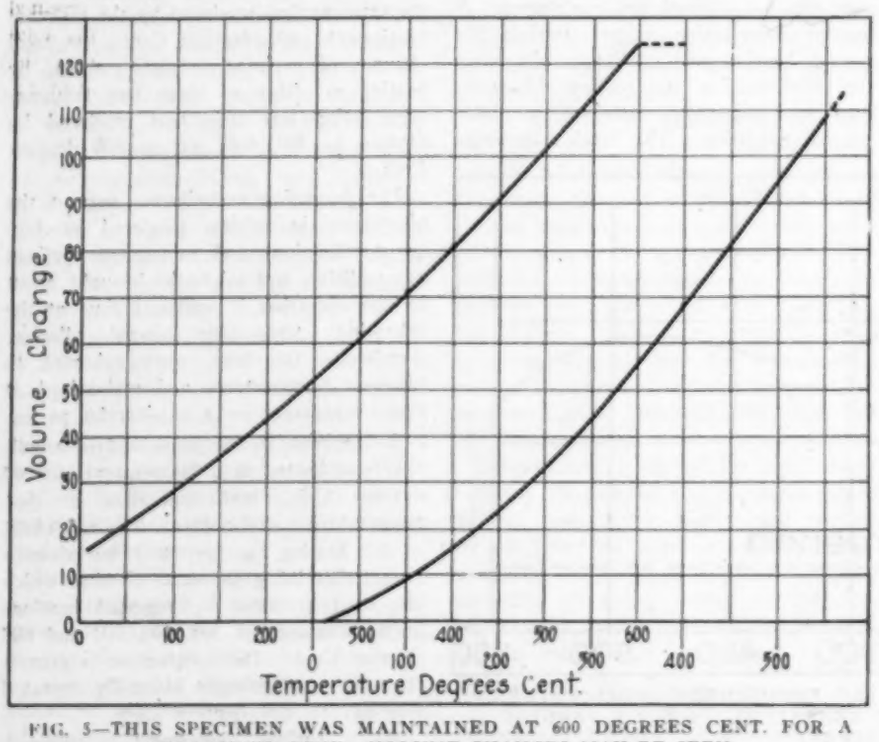
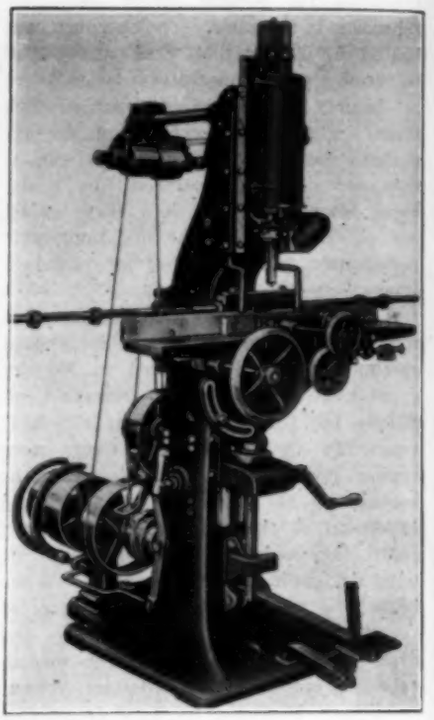


FIG. 5—THIS SPECIMEN WAS MAINTAINED AT 600 DEGREES CENT. FOR A PROLONGED TIME. VOLUME CHANGES MAY BE SEEN

Designs Hollow Mortiser for Rapid Output

A new power feed, vertical hollow chisel mortiser, designed to meet the demand for greater production than is possible with foot machines, and which is adapted for use in pattern making, has been introduced recently by the Oliver Machinery Co., Grand Rapids, Mich. A view of the machine is shown in the accompanying illustration. This machine will handle chisels from ¼ to ¾-inch square. The stroke is adjustable from 2½ to 4 inches in length. Stock 6 inches wide can be centered beneath the chisel. Hollow chisels with 4-inch blades will mortise in material 12 inches high. The column is a rigid, hollow, one-piece casting having a wide flanged floor support, and incloses the feed mechanism with the exception of the drive pulley. A built-in fan blower back of the column furnishes an air blast which cools the tools and keeps the work free from chips.

The power feed mechanism is controlled by a foot lever and is brought into action by a belt tightner, which, when released, brings the brake into action on the rim of the drive pulley. A ratchet is provided to hold the lever down for continuous feeding. The power feed can be run at 18, 26, and 36 strokes per minute. The countershaft is supported at the base of the machine and has tight and loose pulleys; as well as pulleys for the mortising bit and blower fan. The individual drive consists of a 3-horsepower, 1200 revolutions per minute, motor mounted on a bracket in place of the pulleys and coupling to the same shaft. The total height of the machine which requires 15 square feet of floor space is 6 feet.



POWER FEED, VERTICAL HOLLOW CHISEL MORTISER ADAPTED TO PATTERN MAKING

Tests Molybdenum

The study of molybdenum as an alloying element of steel, which has been conducted at Ithaca, N. Y., field office of the federal bureau of mines in co-operation with the Vanadium Corp. of America, is to be continued until June 30, 1923, as a bureau of mines problem, it is announced. The object is to add to the technical information on the value of molybdenum, which, the bureau states, "is slowly taking rank with nickel, chromium and vanadium as alloying elements for high grade steel." The bureau adds that in addition to the more common physical tests, single-blow impact and repeated impact tests have been made on molybdenum and other alloy steels by the bureau.

The Ventura Oil Co. Long Beach, Calif., is planning to erect a $300,000 gas absorption plant.

Adopting Machine Tool Standards

Any Change from Existing Practice Must Derive Benefits Worth Their Cost—Problem Should Be Considered from Both Viewpoints of User and Manufacturer —Agencies for Accomplishing This Work Now Functioning

BY FRED H. COLVIN AND K. H. CONDIT

TWO outstanding phases exist in the problem of standardization of machine tools, one as it affects the builder and the other as it affects the user of the machines. The former can be left to the builders themselves as it has to do with the cost of manufacture and the amount of capital invested. The latter, the effect of standardization on the user, is of direct interest to all.

One of the first considerations in making or advocating any change from existing practice is whether the benefits to be derived are worth the cost. This is true with the proposals for standardization of machine tools, this question of cost frequently making what we are pleased to call standardization really a matter of elimination. We usually eliminate unnecessary sizes and make those which we retain the standard, rather than adopt an entirely new standard which is the result of careful investigation, calculation and experiment. And while this may not be the ideal procedure, it is the practical solution in most cases. Devising a new standard too often means simply adding another variety rather than eliminating many which are now in use.

Those who deprecate this unscientific method of standardization should remember that one of the greatest advantages of standardization lies in uniformity rather than in perfection as to the standard adopted. Taking the gear shift of an automobile as an example, the question of superiority in any particular shift sinks into insignificance in comparison with the advantages of having any one of the gear shifts adopted as standard on all cars. The typewriter keyboard is another excellent example.

Standardization of machine tools from the standpoint of the user can be confined to two specific considerations, namely, work-holding and tool-holding devices. The former affects principally the spindle noses of lathes and the T-slots of planers, milling machines, boring machines, drilling machines and the like. Tool holding devices affect the spindle noses of milling machines and drilling machines, turret holes, tool posts, grinding wheel spindles, etc., and while these appear innocent enough on the surface, they involve the old controversy as to tapers, which is a much debated, question.

Every mechanic who has handled precision work knows that it is not practicable to interchange lathe chucks on extremely accurate work, the idea being that the chuck necessarily will not run dead true on more than one machine. On the majority of work, however, the ability to change chucks from one lathe to another, without the bother of making adapters which usually add considerably to the overhang, would be of great service in many shops. In the same way fixtures should be interchangable from one machine to another by the use of standard T-slots in the tables and probably a standard distance of the first slot from the edge of the table.

The inability to use given turret tools in more than one machine imposes an unnecessary expense on the shop overhead and also directly affects future sales of the machines. The builder whose machine has odd sizes of turret holes, for example, will have a hard time securing an order from a shop equipped with machines having a different size, even though one be as logical as the other. While an order once secured might tend to force a continued use of this machine, it is apt to prevent an order at least as often as to secure one.

Suggests Slots As Beginning

Standardization of T-slots probably is the easiest place to make a beginning and here again undoubtedly it will result in the elimination of perhaps half the sizes, retaining only those which are necessary. A canvas of the total number of each size of T-slot cutters sold should make simple the selection of sizes most in use.

But even T-slots have several points to consider. The width of slot opening, the width and depth of the T for the bolt head, and the depth of metal over the slot to resist pulling out a piece of the table must be thought of. Uniformity as to this latter feature however, is less important than the width, as that is what affects the use of tongs for locating milling fixtures and the like. The distance of the outside T-slots from the edge of table also is important.

It may be well to emphasize here that no matter what is being standardized, it should be remembered that a definite tolerance must be given in each case. And in considering tolerances, let us bear in mind that the modern tendency is toward a unilateral tolerance; a plus tolerance on the slot or hole and a minus tolerance on the part which fits into it. Let us abolish the "plus or minus" tolerance on the same piece.

Standardizing T-slots also involves the standardizing of the T-bolts which are to be used in them. Carl Barth has given this careful attention and his recommendations have been accepted by one manufacturer in Philadelphia, who now produces T-bolts to the Barth standards.

Another point to be considered in standardizing work-holding and tool-holding devices is to have the same size on as many machines as may be practicable. Often it may be convenient to use the same chuck on a 14 and a 24-inch lathe. This is probably too large a range to be covered adequately by the same spindle nose, but it is possible that the same size of nose might be used on two or three sizes of machines. Some builders already use the same feed box on different sizes of machines, which is a sensible practice.

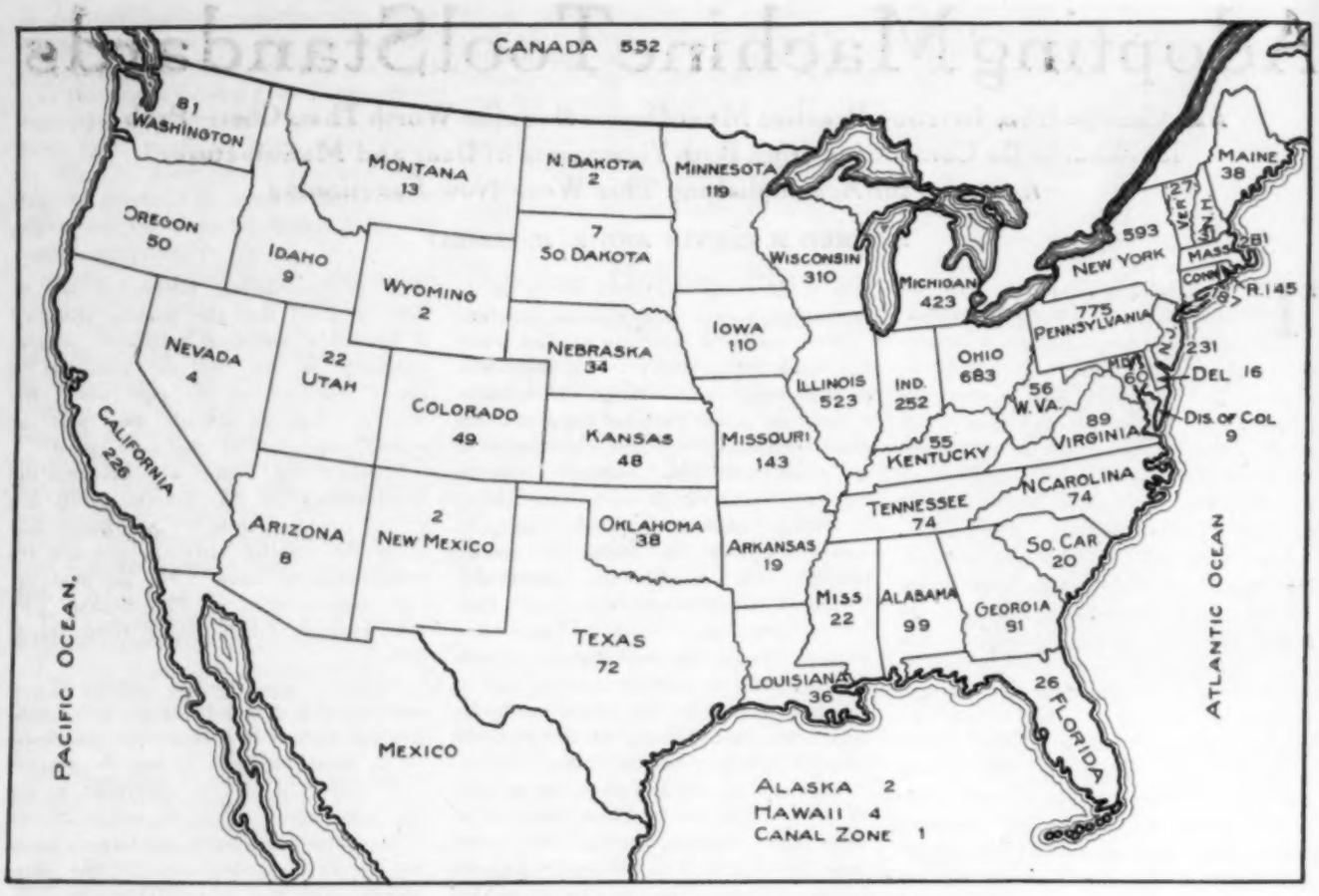
Considerable is heard of standardizing machine capacities, such as the swing of a lathe, but while it would be more convenient all around to know just what was meant by a 14-inch lathe, this is really a problem of the salesman and the buyer. If the seller prefers to cut prices by selling a 17-inch lathe under the name of a 14-inch lathe, it hardly affects the user so long as the work holding or tool holding devices on the lathe are standardized.

Milling machine builders perhaps have done more in this line than builders of any other machine tools. A No. 1 machine now has approximately the same capacity in nearly all makes. The use of numbers, however, has little to commend it, whether it be milling machines or wire gages, and it is believed the main dimensions as to capacity would be more satisfactory to users.

One of the stock objections to standardization is that it prevents progress and the development of new ideas and designs. However, when it is considered that the Society of Automotive Engineers has done more in the way of standardization than anyone else and then note the development in the automobile industry, this objection is answered easily. Is it

(Concluded on Page 929)

From a paper presented at the regional meeting of the American Society of Mechanical Engineers at Springfield, Mass., Sept. 25-27. The authors are editors of the *American Machinist*.



Total Number of Foundries in the United States and Canada, Sept. 1, 1922

Number of Foundries Shows Gain

Recently Completed Statistics Demonstrate an Advance in the Total Number of Castings Plants in the United States and Canada as Compared with 1920—Steel Foundries Only Branch Showing a Loss

STATISTICS just completed indicate that in the past two years the total number of foundries in both the United States and Canada have increased. In November, 1920, the total number of castings plants was given as 6516, while on Sept. 1, 1922, this had been increased to 6733, of which 6181 are in the United States and 552 in Canada. This growth of 217 shops in two years, shows only slightly more strongly in the gray iron foundries which have increased in the two countries from 4857 in 1920 to 4966 at the present time, giving a gain of 109. Brass foundries under the same classifications have increased from 3482 to 3542; while malleable foundries have increased from 267 to 274; and steel foundries have dropped from 449 to 409 as these reports indicate. These statistics are the result of a survey recently conducted by *The Foundry*.

In the United States alone, the total number of foundries shown this year is 199 ahead of 1920. This gain, also, is registered slightly higher in the gray iron shops, which at present total 4508, while two years ago, 4397 were shown. The number of brass shops in 1920 was given as 3163, while at present this is shown to be 3217, indicating a gain of 54. Malleable foundries in the United States alone have gone ahead from 242 to 251, while steel foundries have dropped 30, from 409 to 379. Foundries melting aluminum, in many cases shops casting other metals, which have added aluminum departments have shown the most remarkable gain. In 1920, the total reported in the United States was 2169, while the recent count shows 2500, giving a gain of 331. In Canada, the total of foundries melting aluminum increased from 194 to 253; giving a grand total of 2753 for 1922 as compared with 2363 two years ago. The difference is 390.

The decrease in steel foundries from a grand total of 449 in 1920 to 440 this year, is reflected in the reports of steel shops using electric furnaces for melting. The total number of these reported in 1920 was 206, while the recent census shows a decrease of 4 to 202. Of this number two less were reported in Canada, decreasing from 21 to 19 and 2 were lost to the United States, decreasing from 185 to 183.

A study of the reports from the different states furnishes some interesting information. Pennsylvania, although still retaining the lead, shows a loss in the total number of foundries in the state. In 1920, 803 were noted, while the recent figures give 775. However, this total still gives a marked lead over the second state in the list, Ohio with a total of 683 shops at the present time, while two years ago, 688 were noted. New York still is third, registering a gain of 11 foundries from 582 to 593 at the present time. The other leading states with their 1922 total shops are as follows: Illinois, fourth, 523; Mich-

igan, fifth, 423; Wisconsin, sixth, 310; and Massachusetts seventh with 281. Illinois which showed an exceptional gain of 15.5 per cent during the period from 1918 to 1920, again shows a marked advance in the foundry industry, having increased 39 from a total of 484 to 523 registering a gain of 8.1 per cent during the two-year period just passed.

The Southern states, with but few exceptions, have shown an improvement in the total number of castings plants. Alabama, which from its iron production might be expected to lead shows a total of 99, an increase of 4 shops. Louisiana, Texas, Oklahoma, North Carolina, West Virginia and Florida all show a few more foundries than were reported two years ago.

Among the New England states, Massachusetts shows the greatest gain, increasing from 263 to 281 foundries; while Connecticut, Ver-

Table I

Foundries of the United States and Canada in 1922 and 1920 by States and Provinces

UNITED STATES

	Total foundries 1922	Total foundries 1920	Increase or decrease in two years	Gray iron foundries 1922	Gray iron foundries 1920	Exclusive brass foundries 1922	Exclusive brass foundries 1920	Brass foundries departments of other shops 1922	Brass foundries departments of other shops 1920	Total brass foundries 1922	Total brass foundries 1920	Malleable iron foundries 1922	Malleable iron foundries 1920	Steel foundries 1922	Steel foundries 1920	Foundries melting aluminum 1922	Foundries melting aluminum 1920	Electric steel foundries 1922	Electric steel foundries 1920
Alabama	99	95	+ 4	98	88	2	5	30	34	32	39	2	3	6	5	22	21	2	2
Alaska	2	2	...	2	2	..	..	1	1	1	1	..	..	1	1	..	..	1	1
Arizona	8	9	— 1	8	9	..	..	8	9	8	9	1	..	..	1	4	4	..	..
Arkansas	19	23	— 4	18	20	1	3	14	15	15	18	..	..	1	1	8	11	1	1
California	226	182	+ 44	148	126	59	50	77	74	136	124	5	4	23	19	116	97	19	11
Canal Zone	1	1	...	1	1	..	..	1	1	1	1	..	..	1	1	1	1	..	..
Colorado	49	42	+ 7	30	33	13	8	15	19	28	27	..	..	5	5	22	17	3	4
Connecticut	187	177	+ 10	96	97	72	65	44	39	116	104	14	14	7	5	78	72	3	4
Delaware	16	17	— 1	7	6	6	8	6	5	12	13	1	1	4	4	7	6	2	..
Dist. of Columbia	9	8	+ 1	7	6	2	2	5	3	7	5	..	..	2	3	6	5	1	2
Florida	26	21	+ 5	23	20	3	1	21	20	24	21	1	1	..	..	25	19	..	..
Georgia	81	81	...	76	76	5	5	52	50	57	55	..	..	2	2	41	35	1	1
Hawaii	4	4	...	4	4	..	..	4	3	4	3	..	..	..	..	..	1	..	..
Idaho	9	8	+ 1	9	8	..	..	9	8	9	8	..	..	..	..	8	8	..	..
Illinois	523	484	+ 39	328	328	123	120	101	90	224	210	38	31	25	26	202	179	15	11
Indiana	252	242	+ 10	188	181	42	44	62	69	104	113	19	17	11	11	86	72	3	6
Iowa	110	110	...	95	96	9	8	42	46	51	54	1	3	6	7	49	43	3	3
Kansas	48	46	+ 2	45	42	2	3	27	30	29	33	1	2	..	1	29	28	..	..
Kentucky	55	55	...	41	41	12	14	16	15	28	29	1	..	2	1	19	19	..	..
Louisiana	36	34	+ 2	29	29	7	5	20	20	27	25	..	1	3	3	16	13	1	1
Maine	38	37	+ 1	34	30	4	7	25	23	29	30	..	..	..	..	15	15	..	..
Maryland	60	63	— 3	42	44	18	18	23	24	41	42	1	1	..	4	27	23	..	1
Massachusetts	281	263	+ 18	173	165	92	88	57	55	149	143	3	3	16	17	120	99	8	7
Michigan	423	388	+ 35	263	253	122	108	90	82	212	190	19	17	15	18	172	133	6	8
Minnesota	119	107	+ 12	95	91	19	13	50	49	69	62	1	2	8	9	59	48	3	4
Mississippi	22	17	+ 5	22	17	..	..	22	17	22	17	..	..	..	..	11	7	..	..
Missouri	143	133	+ 10	197	105	37	27	36	44	73	71	6	6	5	5	64	50	2	1
Montana	13	12	+ 1	13	12	..	..	12	11	12	11	..	..	..	..	8	7	..	..
Nebraska	34	32	+ 2	29	28	5	4	20	19	25	23	..	1	2	2	25	21	1	1
Nevada	4	4	...	3	3	1	1	3	3	4	4	..	..	..	..	3	3	..	..
New Hampshire	31	34	— 3	26	29	5	5	14	16	19	21	1	1	1	1	16	16	1	1
New Jersey	231	223	+ 8	154	153	67	61	52	53	119	114	6	8	7	7	94	78	1	2
New Mexico	2	2	...	2	2	..	..	2	2	2	2	..	..	..	..	2	2	..	..
New York	593	582	+ 11	386	399	162	151	169	180	331	331	28	29	19	28	239	203	10	16
North Carolina	74	73	+ 1	73	72	1	1	57	51	58	52	1	2	1	1	50	39	..	1
North Dakota	2	2	...	2	2	..	..	1	1	1	1	..	..	..	..	1	1	..	..
Ohio	683	688	— 5	455	464	170	176	107	123	277	299	37	42	52	52	208	193	30	27
Oklahoma	38	35	+ 3	32	31	5	3	22	20	27	23	1	1	2	3	23	18	1	2
Oregon	50	50	...	44	44	4	4	24	28	28	32	1	1	4	7	26	24	2	3
Pennsylvania	775	803	— 28	574	606	130	143	213	209	343	352	28	24	93	100	235	229	30	31
Rhode Island	45	43	+ 2	28	27	14	13	8	11	22	24	1	1	1	1	20	20	1	..
South Carolina	20	21	— 1	19	21	..	..	18	19	18	19	..	..	1	1	13	12	..	1
South Dakota	7	6	+ 1	6	6	1	..	4	3	5	3	..	..	..	..	4	3	..	..
Tennessee	74	77	— 3	70	72	5	5	30	34	35	39	1	1	2	2	27	27	..	..
Texas	72	68	+ 4	59	56	13	12	38	38	51	50	..	1	4	5	39	33	2	3
Utah	22	21	+ 1	20	21	2	..	16	15	18	15	..	..	2	2	15	9	1	1
Vermont	27	26	+ 1	25	25	2	2	14	14	16	16	..	..	..	..	14	11	..	..
Virginia	89	92	— 3	87	89	2	3	63	63	65	65	2	3	6	2	44	43	3	5
Washington	81	77	+ 4	65	62	13	12	40	36	53	48	1	..	10	12	44	40	9	10
West Virginia	56	53	+ 3	44	44	9	6	26	27	35	33	1	1	4	4	26	19	2	..
Wisconsin	310	307	+ 3	212	210	63	58	80	79	143	137	28	20	25	25	116	91	15	13
Wyoming	2	2	...	1	1	1	1	1	1	2	2	..	..	..	..	1	1	..	..
Total in U. S.	6181	5982	+199	4508	4397	1325	1263	1892	1901	3217	3163	251	242	379	409	2500	2169	183	185

CANADA

Alberta	16	17	— 1	13	16	3	1	13	15	16	16	1	..	..	3	14	11	..	1
British Columbia	31	33	— 2	26	30	4	1	19	24	23	25	..	2	2	3	19	11	2	3
Manitoba	15	16	— 1	12	13	2	1	6	7	8	8	..	..	1	1	8	7	1	1
New Brunswick	20	19	+ 1	18	17	2	2	13	15	15	17	..	..	..	1	10	9	..	..
Newfoundland	2	2	...	2	2	..	..	1	1	1	1	..	..	..	..	1	1	..	..
Nova Scotia	30	30	...	29	30	..	..	20	22	20	22	2	1	3	2	8	10	1	..
Ontario	327	310	+ 17	264	259	43	38	131	125	174	163	15	17	10	13	140	100	4	9
Prince Edward Island	3	2	+ 1	3	2	..	..	2	2	2	2	..	..	..	..	1	1	..	..
Quebec	104	100	+ 4	87	87	12	10	50	50	62	60	5	5	14	16	48	39	11	6
Saskatchewan	4	5	— 1	4	5	..	..	4	5	4	5	..	..	..	1	4	4	..	1
St. Pierre Et Miquelon	..	..	...	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Total in Canada	552	534	+ 18	458	460	66	53	259	266	325	319	23	26	30	40	253	194	19	21
Total in U. S. and Canada	6733	6516	+217	4966	4857	1391	1316	2151	2167	3542	3482	274	268	409	449	2753	2363	202	206

mont, Maine and Rhode Island all have gone forward. New Hampshire shows only 3 plants less than two years ago.

Among the Canadian provinces, Ontario still maintains a long lead with a total of 310 as compared with 319 foundries two years ago. Quebec is second with 100 as compared to 102; while British Columbia has risen into third place with a total of 33 at present compared with 27 two years ago, Nova Scotia dropping from 34 to 30.

The gray iron foundry order closely parallels the standing of the states in the total number of foundries reported. Pennsylvania leads with 574; Ohio is second with 455; New York is third with 386; Illinois is fourth with 328; Michigan is fifth with 263; and Wisconsin is sixth with 212.

In Canada, Ontario has the greatest number of gray iron plants, showing a total of 264, while Quebec has 87; Nova Scotia, 29 and British Columbia, 26. It will be noted that the order of rank in the latter two mentioned provinces is reversed from that shown in the total number of foundries. British Columbia's greatest gain was represented in foundries melting aluminum and a slight gain is shown in the number of exclusive brass foundries.

The ranking importance of the states measured in terms of the total number of brass foundries shows no change over the two year period just passed. Pennsylvania leads with a total of 343; New York is second with 331; Ohio is third with 277. The others which follow are: Illinois, fourth, 224; Michigan, fifth, 212; Massachusetts, sixth, 149; and Wisconsin, seventh with 143.

A greater change is noted in the distribution of malleable foundries. At the time of the last census Ohio was ahead with 42 malleable shops. At present, Illinois is in the lead with 38, Ohio drops into second place with 37; New York, Pennsylvania and Wisconsin each have 28; while Michigan and Indiana each report 19 malleable plants. The increase in the total number of malleable foundries from 268 to 274 is marked by a growth of 9 in the total number in the United States and a loss of 3 in Canada.

No marked change in the standing of the states as steel castings producers is noted. Except for the loss in the total number of steel foundries, the most noteworthy feature is the continued advance of California in the ranks. An increase from 19 to 23 in the total number of steel foundries in the latter state places it in fourth place. The others in order are Pennsylvania, first, 93; Ohio second, 52; Illinois and Wisconsin tied for third, each with 25 and New York fifth with 19.

More marked changes are noted in the electric steel castings producers. Pennsylvania has dropped back from first place through its decrease from a total of 31 electric steel castings plants to 30, while Ohio has gone forward to a tie for first place with a total of 30, where only 27 were shown in 1920. California has come up from fifth to second place by its increase from 11 to 19 electric foundries. Illinois and Wisconsin each report 15 shops; while New York is fourth with 10.

In Canada, Quebec is now in the lead with electric steel foundries, having 11, compared to 6 reported in 1920, while Ontario shows only 4 as compared to 9 two years ago.

The ranking order of the cities in terms of the total number of foundries shows marked changes. Chicago still is in the lead with a total of 197, compared with 194 two years ago. Detroit has advanced from fourth to second place, showing 134 shops in 1922, compared to 122 two years ago. New York is third with 129; Cleveland fourth with 117 and Philadelphia still is fifth with 97. Milwaukee also retains its relative position, sixth, although a decrease from 92 to 82 shops is reported. Boston has forged ahead to seventh place, usurping that formerly held by Pittsburgh, through its advance from 70 to 77 foundries. St. Louis now is eighth with 75 plants, while Pittsburgh has dropped back to ninth place with 70 plants.

The accompanying Table II shows some interesting facts. This gives a list of the cities of the United States and Canada which have 15 or more foundries on Sept. 1, 1922. It shows a total of 2282 castings plants, while the previous report shows 2220, marking an increase in these principal foundry centers of 62 or 2.8 per cent over the two year period. As was noted previously, the grand total increased from 6516 to 6733, giving a gain of 217 or 3.32 per cent. In other words, the increase in the foundries in the leading centers has not been so marked as it has in the communities which previously are not rated as leading castings producers.

Table II

Leading Foundry Cities in the United States and Canada

	Total foundries, 1922	Total foundries, 1920
Chicago	197	194
Detroit	134	122
New York	129	125
Cleveland	117	123
Philadelphia	97	100
Milwaukee	82	92
Boston	77	70
St. Louis	75	68
Pittsburgh	70	73
Cincinnati	64	61
Los Angeles	63	48
Buffalo	61	66
Toronto, Canada	55	53
Newark, N. J.	44	39
Minneapolis	43	37
San Francisco	42	42
Baltimore	39	39
Dayton	37	38
Columbus	37	37
Indianapolis	36	35
Toledo	35	38
Erie, Pa.	34	30
Rochester	33	29
Montreal, Canada	32	29
Birmingham	32	30
Denver, Colo.	32	26
Louisville, Ky.	31	31
Seattle	30	31
Canton, O.	30	29
Syracuse	28	28
Portland, Oreg.	27	26
Reading	26	26
Springfield, O.	26	26
Chattanooga	25	28
Bridgeport, Conn.	25	25
Atlanta	24	25
Grand Rapids	24	24
Kansas City	23	22
Worcester, Mass.	23	22
Providence, R. I.	22	22
Racine, Wis.	22	20
Rockford, Ill.	22	18
Hamilton, Ont.	21	19
Oakland, Cal.	21	16
Jersey City	20	23
New Haven, Conn.	18	15
Quincy, Ill.	17	17
Anniston, Ala.	17	17
Vancouver, B. C.	16	17
St. Paul	16	15
Waterbury, Conn.	16	15
Akron, O.	15	19

School Offers Variety of Night Courses

Night courses offered by the Carnegie Institute of Technology, Pittsburgh, cover a broad field, enabling the student to advance, no matter how limited may be his previous training. The majority of the students enroll in the industrial class where the variety of courses offered is large and the requirements are more lenient. In the building trades class the subjects taught are plumbing, carpentry, bricklaying, sheet metal work, electric wiring, structural drafting, building trades drafting, heating and ventilating, concrete work and masonry, plan reading and estimation. In the machinery trades, courses are given in foundry work, forging, pattern-making, machine shop practice, and heat treatment of steel. Additional courses include telephony, practical chemistry, mechanical drafting, stationary engineering and printing. Special courses are offered for teachers in industrial arts. The work is more advanced in the college of engineering, instruction being given in chemistry, civil engineering, mechanical and metallurgical engineering. Courses are also offered in architecture, painting and illustration, applied arts, music, drama and sculpture.

Three Shifts vs. Two, in Steel

Practicability of Changing Work Period System in the Industry Investigated from Technical Viewpoint—Report in Favor of Shorter Hours as Adopted by Executive Board of American Engineering Council

BY BRADLEY STOUGHTON

THIS article is the third of a series completing the publication in the THE IRON TRADE REVIEW *of the report, "A Comparison of Two-shift and Three-shift Operation in the Iron and Steel Industry", adopted by the executive board of the American Engineering council, in Boston, Sept. 18. The full report, from which incomplete summaries have appeared from time to time in various places, has now appeared in* THE IRON TRADE REVIEW. *The first article was published in the Sept. 21 issue, and the second in the Sept. 28 issue. This report has attracted a great deal of attention and is likely to be referred to frequently in further discussion of the merits of the three-shift system in the industry.*

REFERENCE has been made to the opinion of experts who believe that the greater efficiency of labor, and other saving circumstances such as relate to repairs, overhead, waste, quality, labor turnover, etc., make the three-shift system and economic and commercial advance. But these opinions cannot be supported by figures because cost figures are necessarily surrounded by the utmost secrecy. The opinion of those who think there is a slight balance in favor of the three-shift system is opposed by the contrary opinion held by others who also have had experience with both systems. However, there are some instances of actual labor savings which have been communicated to me with permission to include in this report, on the understanding that no company names are mentioned.

One of the most conspicuous of these is at a Garrett wire rod mill in a competitive center, which changed from two to three labor shifts several years ago and is still operating its "continuous operation" labor on 8-hour shifts. The work of a rod roller at Garrett mills is hazardous, hot and severe. The roller stands in the midst of three or four coils of white-hot, rapidly moving bands of steel. The metal shoots from between the rolls at about the rate of a mile a minute at its maximum speed, because it must be rolled so fast the heat produced by the mechanical kneading of the metal shall more than counteract the radiation from the 1-inch section of rod, leaving it actually hotter at the end of the rolling than it was when it came from the furnace. He catches it deftly in his tongs, swings the end around in a circle, so that the rod forms a long coil on his side of the roll train, and then passes it back between the rolls, to be caught by his "buddy" on the opposite side.

This operation must be repeated in time to turn back and catch the next rod as it comes through. Always there are several writhing coils on both sides of the train of rolls. The least mistake or lack of attention is almost certain to result in an accident which may cause loss of metal being rolled or of human life.

Obviously this work requires the maximum of expertness and attention, and it is universal to have a double set of rollers on each 12-hour shift, relieving each other at intervals. But at the mill now in question several years ago the double crews on 12-hour shifts were changed to single crews on 8-hour shifts, with a saving of 25 per cent of the labor. This saving has been continued ever since, with apparent success.

It is not the function of this report to comment on the humanitarian aspect of the change, but if it be urged that such a saving, which involves working men under severe strain for eight hours continuously, is a hardship, then the answer may be made that from the technical standpoint we may change all the double crews on 12-hours shifts to single crews on 8-hour shifts and allow each of them relief for 25 per cent of the time, that is for two hours out of every 8-hour shift, without using any more labor than is employed at present. Each man would work, say, one hour and then be relieved for 24 minutes. It is evident that if it has been done satisfactorily for so many years without any relief for eight hours, then it can be done with corresponding increase of efficiency if five rest periods of 24 minutes each are interposed.

Another example of saving is a case of work on cranes which was very severe because the men were exposed to strong heat. They declined to work, even with some intervals of relief during the 12-hour shift, unless "oilers" were employed to take care of the motors and mechanism on the bridge. But when the 8-hour shift was introduced they voluntarily tended both levers and bridge mechanism with consequent saving of 25 per cent of the number of men employed.

In another case, the men themselves, in a spirit of good will resultant upon the 8-hour shift being introduced, pointed out a slight change whereby three men per turn could be reduced to two men per shift. It is true that in time the management might have noticed this possible saving, but it had not done so for years. Men who are closely engaged in a manual operation often can see improvements an onlooker may overlook.

Two other instances are: Pitmen in an open-hearth mill, where two men working the 12-hour shift were replaced by single men on the 8-hour shift; and bottom men on soaking pit furnaces, where one man on the shorter shift replaced two men on the 12-hour shift. The open-hearth pitmen work around the hot slag and keep the pit clean. Their work is service both physically and from the heat endurance standpoint. The soaking pit furnaces heat steel ingots while they are standing on end preparatory to rolling them to blooms. Slag scale, etc., collect in the bottom of these furnaces and the work of cleaning them out is severe. In this case, as in the example of the open-hearth "cinder snappers", or pitmen, it is a matter of opinion whether two-man crews on the 12-hour shift is not over-manning, and one-man crews on the 8-hour shift is not under-manning, but I have cited the examples as instances of actual experience.

Now there are other cases of a more general nature. For instance, the management of a plant which changed from two to three shifts, and has been working the shorter shift for a period of years, assures me that less labor is used both on the open-hearth platform and in the pit. It is true that at least a part of this saving is due to the use of labor-saving appliances which might have been installed without introducing the three-shift system, but there are a very great many plants which lack some or all of these labor-saving appliances and which could introduce them with profit. The interest and maintenance charges against these appliances, plus their cost for power, is only a small fraction of the labor cost per ton of metal in open-hearth practice.

A second plant advises me of its experience in full confirmation of the result stated in the preceding paragraph.

Furthermore, this experience proves that the saving is due at least in part to the increased ability and efficiency of the men working the shorter shift, quite independent of the labor-saving appliances. If any plant management in the country claims to be as fully equipped with labor-saving appliances in its open-hearth department as possible it can be asserted confidently that this is not so, although doubtless, many plants believe themselves to be fully equipped, or at least, to be as fully equipped as the plant management thinks economical.

Still another plant advises that its rolling mill crews increased their efficiency by more than 50 per cent after changing from two to three shifts, and that in the tin-house it reduced the number of men on accessory operations when it changed from 12-hour to 10-hour shifts. It may be argued that the improvement was possible because this particular plant was below the standard of efficiency, or of discipline, before the change, but I know of no justification for such a charge. And the management of the plant in question asserts as the lesson of its experience on two shifts and on three shifts that wherever the work is very taxing, either from the physical or the heat-exposure conditions, men can do as much work in eight hours as they can do in 12 hours. This assertion is quoted here as bearing upon the evidence under discussion, but not to be taken as an accepted generalization. Others, with experience with both systems of labor employment, declare that men do not produce as much in eight hours.

These paragraphs may be appropriately concluded with the statement of a technical truth which we believe is universally accepted, namely: That what can be technically accomplished in one or two instances can be repeated as a matter of regular practice, provided the conditions are understood and repeated. Therefore, if these examples of labor economy can be made at any plant they can be made at all plants where the same conditions are repeated.

Total Costs Per Ton Lower

There are at least two instances where the skill, care, uniformity, expertness and attention of the workmen have so important an effect on the cost of the operation that it has proved economical in some cases to work them eight hours instead of 12 hours. It cannot be asserted that it is universally cheaper to pay 50 per cent higher labor costs per ton of product for these skilled operations, but only that it has proved cheaper in certain cases where careful records have been kept. The two operators in question are: The scale car man at blast furnaces, and the blower of the bessemer converter. Each of these men receive a wage which is from a fraction of a cent per ton of product to about 2 cents per ton of product. A slight increase in expertness or attention on the part of either may save several times the wages paid them. If the converter blower comes to work insufficiently rested or suffering from a bilious attack the temperature of the metal and the percentage of second quality product may vary so far from the standard as to run into hundreds of dollars in a day.

There is a difference of opinion as to whether the shorter shift will make an important difference in the expertness of the blower, but careful records and observation in one case, and general experience in more than one other case has convinced the management that its cost is far exceeded by its savings. This conclusion may be attacked on technical grounds.

The converter blower is the man who judges by eye the temperature and the chemical conduct of the bessemer process. His co-operation is encouraged by paying him a wage based on the product of the bessemer mill. His observation of the flame issuing from the mouth of the converter determines the practice as to increasing or decreasing the temperature of the metal in the converter and the time at which the operation is stopped. His skill in operating the levers has its effect on determining the percentage of waste of metal. His control over the time when a vessel is put into service every 20 minutes or so, determines the regularity with which the supply of metal coming into the mill may be maintained, so as to give the least interference and the greatest rate of flow. The bessemer mill is run on the principle of a cycle of short operations, repeated a great many times, and each adjusted to the other so as to minimize the interferences and delays. On the regularity with which the ingots flow from this mill, or train loads of ingot cars, depends the economy of operation of the rolling mill which it usually serves.

It has been said of some skilled operations in steel mills that they are performed better at the end of a 12-hour shift than at the beginning. I have never heard this said of the converter blowing and my own observation and experience of several years would oppose such an assertion. It might be said that if the blower misused his extra four hours of leisure he would do his work worse on three shifts than on two, but this is a case for discipline. It happens that the supply of converter blowers is ample for at least the next decade, that they may be trained without special difficulty, and that discipline may be applied better on the three-shift system than on the two because men are more attracted to jobs requiring 8 hours work.

Coming to the scale car man at the blast furnaces: He operates an electric larry which travels under a series of storage bins at the back of the furnace. It receives its load from one of these bins, weighs it, controls the weight in accordance with the "burden" established by the proper official, carries it to the foot of the furnace and dumps it into the charging skip, which in turn conveys it to the mouth of the furnace. The work is arduous because it requires care, close attention and is of a monotonous character. So far as I know, no scale car men are able to work steadily for 12 hours, and no one has ever said that their attention or regularity was better at the end of a 12-hour shift. The regularity with which the furnace is charged is the chief factor in determining the temperature of the top gases, and affects the fuel economy of the operation. In the best practice, the amount of coke used per ton of pig iron made will be from 1800 to 2000 pounds. This will cost, say $7 per ton of pig. Of course, this rate will vary, depending on the location. If the fuel economy falls off as little as 1 per cent the cost per ton of pig would be increased 7 cents representing $35 to $45 loss in 24 hours. It is easy to see how increased loyalty and efficiency of the scale car man can run into profits on production.

Relieve Scale Car Man

Therefore, the efficiency of the scale car man is kept up by relieving him at intervals during 12-hours shifts. This is done in at least three different ways. He is allowed resting periods, when the stock-line level falls. The top-gas temperature rises in consequence and a certain loss of fuel economy is endured. Secondly, an exra man is employed for a group of several blast furnaces and he relieves the scale car men in succession, besides doing other work, such as keeping stock records, etc. Finally, the skip operator relieves the scale car man at intervals; but this usually involves some irregularity in the operation of the charging skip. At the most modern furnaces records are kept automatically of the stock-line level, the top-gas temperature and the regularity of operation of the charging skip. Discipline is applied when any irregularity in these records is shown and cannot be properly explained. But it is the observation of many blast furnace superintendents that regularity cannot be maintained on the 12-hour basis. Where the scale car man works only eight hours, I am informed that he is able to do his work regularly and continuously for his whole shift.

There are a great many cases where, as will be obvious to everyone, no cost per ton can be lowered by working three shifts instead of two shifts. For ex-

ample, the engineers in boiler houses and power plants have very little to do except watch and tend the machinery or fires. In the case of the boiler houses, better attention might be given by men working the shorter shift, and better attention may give lower costs, but certainly in the engine room, as far as I have been able to learn, the operation is so regular and breakdowns are so infrequent that increase of efficiency on the part of the men could have little result in lowering costs. I have studied the subject at some length, but it does not seem probable that a difference of opinion will be met, at least as far as steelworks power plants are concerned, and therefore a discussion does not seem warranted. The amount of money involved is not very large, because a few engineers are spread very thin over a great tonnage produced in a large plant. If a change were made to three shifts it would doubtless be based on humanitarian, political or psychological grounds.

In the case of those men who keep the equipment in good condition and who are known variously as "maintainence men", "millwrights" and "electricians", it is now common practice (by this I do not mean universal practice) to work them two shifts of 10 hours each with 12-hour shifts only in cases of emergency. Where they have been employed on 8-hour shifts they have often abused the privilege by working four or more hours at outside shops, such as automobile repair shops, electric repair work, etc. Under good disciplinary conditions it is possible to prevent this because it is recognized as unjust both to the plant that employs them and to their fellow-workmen. But where the three-shift system results from a victory of labor over the management, or where labor is arrogant or demoralized, this and other abuses are rampant.

Obviously, the labor costs per ton when working three shifts of 8 hours each, will be 50 per cent higher than those when working two shifts of 12 hours each, in the cases mentioned previously. Some assert that the costs are even more than 50 per cent higher, because labor is even less efficient on 8-hour shifts than it is on 12-hour shifts. This assertion may be true in the experience of these witnesses, but it need not be true and it is not true when the change is made wisely and the conditions are understood.

Except in those cases where we can show a saving because of increased labor efficiency and a saving on account of improved quality, regularity of operation, etc., it is evident that all operations of the iron and steel industry will be more costly per ton of output when working three shifts than when working two shifts. This is so obvious that it would seem unnecessary to mention it except that its omission might be considered by some as giving undue emphasis to the other side of the question.

Peak and Valley Labor Loads

We have already pointed out the relation between peak labor loads and the persistency of the 12-hour shift, and have said that even when the nature of the iron or steel process does not involve peak and valley loads they occur sometimes because of breakdowns.

In the question of the elimination of peak labor loads it is well to note that the severity of the labor involved in a manual operation may be due either to great physical exertion demanded, such as carrying heavy loads of pig iron a distance of about 100 feet, repeated many times in the course of two hours, or to exposure to very high temperature, such as repairing the tap-hole of an open-hearth furnace or to both together, such as cleaning up a mess of semi-liquid slag, or shoveling broken metal into a ladle containing 100 tons or more of white-hot steel.

If we could know just when peak loads would occur it would greatly economize the problem of carrying them, but the peak loads which result from breakdowns obviously are going to occur at times impossible to predict, and the inevitable irregularities of furnace operation brings their peak loads sometimes at one hour of the day and sometimes at another. This irregularity prevents the handling of the peaks by an extra gang working only when needed. And so we must always have on hand a crew of men sufficient to handle the maximum load that the process is going to require, with the certain result that some or all of these men are going to lack occupation when the labor requirements of the operations are small.

This will be made more clear, perhaps, by reference to Fig. 1, which is an idealized representation of peak and valley loads at a furnace during a 24-hour interval. The labor requirements of the process are indicated by the ordinates, and the hours of the day by the abscissae. The 12-hour shift is indicated by the broken line, and the 8-hour shifts by the dotted lines. The curved line represents the labor requirements at the different hours. For simplicity it is made more regular than it will usually occur in practice.

It is evident from this curved line that the maximum labor requirement is 10 men, and therefore 10 men must always be on duty. With the two-shift system this means 20 men to cover the 24 hours. With the three-shift system it would be 30 men. But, now, if we could eliminate the peaks in the labor loads, smooth them out and distribute them evenly over the 24 hours, the line E-F would represent the average labor requirement of the process, and six men would handle it. That is, 12 men per day on the 12-hour shift or 18 men per day on the 8-hour shift, less than are required to take care of the peak loads working the 12-hour shift.

This, then, is what is meant by the peak loads involving the necessity of having men on hand who lack occupation during certain phases of the furnace operation. It is obvious that 10 men working eight hours cannot exert a reasonable amount of energy during their day's labor.

It is also evident that if we could handle the greater part of all the peak loads by labor-saving devices as few as four men could take care of all the rest of the labor requirements and would work pretty steadily during their shift. This achievement would solve the three-shift problem by making the practice economical, by giving each man steady work for eight hours and allowing him 16 hours per day for rest and recreation. It would also make the labor requirements so constant that a man working 12 hours would be unfairly taxed, and the usual double shift, that is, the 24-hour shift which comes every two weeks when changing shift would be a real hardship.

It is not here claimed that the technical advances in the iron and steel industry have accomplished as much as is indicated in the foregoing in eliminating almost all the peak load by means of labor-saving devices, but they have done a great deal. For example, comparing an old-fashioned blast furnace without labor-saving devices with a modern furnace equipped as it should be: The former will make, say, 240 tons of pig iron per day with about 40 men per shift, or 80 men per 24 hours, an average of three tons of pig iron per man per day. The modern furnace will make 600 tons of pig iron with one-half the number of men to do the same work, an average of 15 tons of pig iron per operating man per day. This does not include power house, etc. The advance is due to mechanical and other labor-saving devices.

It is true that even with this advance the peak loads are not yet eliminated from the blast furnace operation, but they are greatly reduced, so that one of the most modern of American blast furnaces keeps its men steadily occupied on what the management believes is economical work for the whole of three 8-hour shifts per day. Furthermore, it believes that what peak loads do occur can be handled with slightly less men working the 8-hour shift than working the 12-hour shift, on account of increased efficiency and morale.

The peak and valley loads shown in

Fig. 1 are not exaggerated for the normal practice of the blast furnace. For the open-hearth furnace the irregularities will still be great, but not as great under good modern practice of labor-saving appliances as at the blast furnace, except when accidents, delays or interruptions occur. In the case of the bessemer mill and the rolling mills the normal irregularities are still less, but especially in the case of the rolling mills, idle periods due to breakdowns, with consequent peak loads for the "maintenance men", are not uncommon. At present they occur much less frequently than a decade or two ago, on account of mechanical improvements and use of electrical power. They are a great source of added expense in manufacturing cost per ton of output, not so much on account of the cost for repairs but because of delays and interruptions which decrease output and correspondingly increase overhead and labor expense per ton. Any added efficiency of the men in respect of greater care or alertness in preventing accidents or delays, in more expert operation of the levers to increase output, in avoiding mistakes or false moves, will make itself evident immediately in improved practice which lowers costs.

Returning now to the question of peak loads occurring normally in furnace operations, such as illustrated in Fig. 1. A peak load will be noted as coming at the eleventh hour of the first 12-hour shift; this shift is already fatigued by handling two peak loads. The temptation will be, if not actually to delay operations so as to defer this peak load until the next crew comes on duty, at least to avoid hastening matters so as to get the full work to do. This is not a theory. It is a common experience. Even a loyal foreman cannot have the same regard for the dividends of an absent and almost mythical stockholder as for the fatigue of men, who in hot weather and under conditions of furnace irregularity are sometimes in a pitiable state of exhaustion.

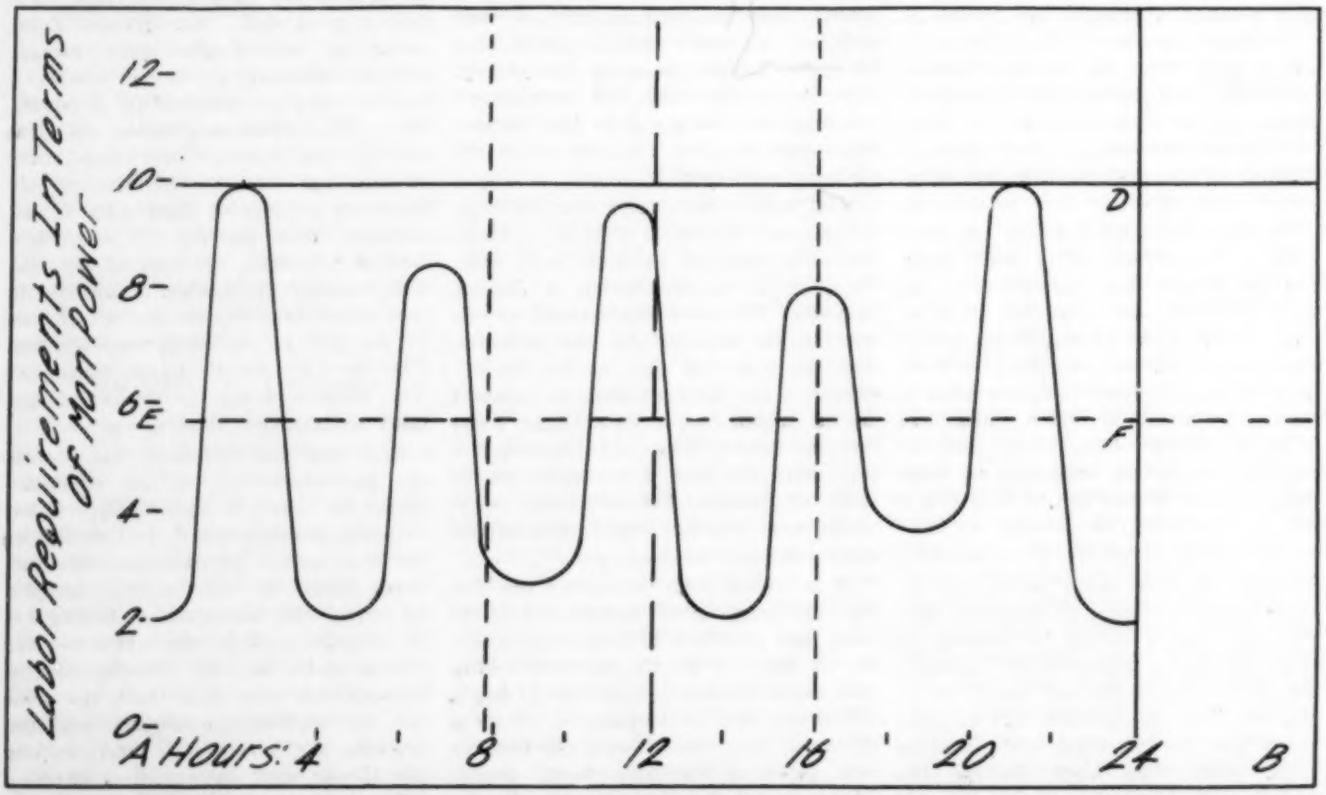
Right here there will be a difference of opinion with those who have not seen the three-shift system in successful operation. They may argue that whereas this delaying of the peak load so as to "let George do it" can come only twice during the 24 hours on the two-shift system, it will come three times on the three-shift system, and that the result will be worse delay than before. I have given much time to studying this question at plants working on the three-shift system, with former experience on the two-shift system, and the answers I have received have been universally in favor of three-shift system, for four reasons:

1. The men are not fatigued by eight hours' work; the temptation to shirk is not so great.
2. Discipline is better; you cannot put much pressure on a man when he is so tired that he is almost ready to quit.
3. A long rest is coming, and
4. There is not the same bitter feeling towards the work which the long shift sometimes engenders.

When a modern blast furnace is tapped and 125 tons of liquid metal run out into the cast-house the labor of taking care of this product is immense, as well as the labor of making the cast-house ready for the cast. Even the labor of opening the taphole used to be great on some occasions, but this is now minimized by the use of oxygen to burn a hole through. The labor of closing the hole is now much less on account of the use of the "mud gun" to do this work. The labor in the cast-house was first much reduced by means of jib cranes wherever a place could be found to support them, then by traveling cranes spanning the cast-house, then by "pig breakers" to eliminate the sledge hammer to break the pigs away from the sow. Finally, the cast-house is dispensed with entirely and the liquid pig iron is allowed to run directly into ladles supported on railroad cars, and taken away from the blast furnace to be stored in reservoirs until wanted at the steel works, or else cast into pigs in mechanical pig-casting machines. The last word in labor economy is to get the runners so short by good design of the furnace house that we shall have the minimum length of "skull", because some iron chills in these runners, form a "skull" and has to be broken up and disposed of.

The crew necessary for operation used to consist of:

One keeper.
One first helper.
Four to eight assistant helpers, who used to prepare the "pig beds" to receive the liquid iron, open and close the taphole, run the cast, look after the runners,



IDEALIZED REPRESENTATION OF PEAK AND VALLEY LABOR LOADS RESULTING FROM IRREGULARITIES IN REQUIREMENTS. FOR EXPLANATION IN DETAIL SEE ARTICLE UNDER SUBTITLE "PEAK AND VALLEY LABOR LOADS"

Four to eight iron carriers.
One "cinder snapper".
One "scrap man".
One man to look after the hot blast stoves.

The crew can now be reduced to:

One keeper.
Two helpers.
One "cinder snapper".
One hot blast man.

When working eight hours instead of 12 the crew is reduced to four men, one of the helpers being eliminated, and it is even said that it might be reduced to three if the runners could be made so short that the "mud man" and the scrap man could be dispensed with.

Back of the furnace we used to have piles of ore, flux and coke from which piles the shovelers filled hand buggies which were wheeled to the foot of the furnace, weighed, carried up in an elevator and dumped into the top. It took more than 20 men to do this work.

Today a long line of bins is situated back of the furnaces. These are filled directly from the railroad cars which bring the materials to the plant, or else by great gantry cranes which span the storage piles and the storage bins. Underneath these bins runs an electric larry which receives its load by gravity, weighs it, carries it to the foot of the furnace and dumps it in a skip, which is then elevated to the top of the furnace and dumped into the furnace hopper without any manual labor whatever. The 23 men who used to handle 800 tons of material charged into the furnace have been reduced to about six or eight men handling more than 2000 tons of "burden" or "stock".

This "stockpile" work, or filling, is not subject to peak loads, as is the work in front of the furnace, which increases every time the furnace taps, say five times in 24 hours. Consequently the fillers do not normally get any resting periods in their 12-hour shift. Theoretically there are enough men to overman the job and the filling crew can rest at intervals, provided the furnace is kept always full. In practice it usually works out that the management makes a concession to the fillers by which they are allowed a half-hour's rest occasionally, at which time the stock-line level will be lowered in the furnace, the top-gas temperature will rise, and the furnace efficiency will be correspondingly reduced.

Keeps Accurate Data

Contrast this with the practice of the Ford Motor Co.'s blast furnace at River Rouge, which is run on an 8-hour shift and a 48-hour week. An automatic record is kept of the height of the stock line in the furnace, the temperature of the top gases and the times at which the charging skip makes its trips. Any deviation from regularity in these particulars is checked up and explained. The high wages and short hours prevailing there makes it possible to enforce the most rigid discipline where necessary, and no concessions of furnace efficiency are made to provide resting periods for the men. Indeed, resting is not permitted. The men must keep occupied during the full hours of labor. This applies to the labor in front of the furnace as well as the fillers and stock men.

We cannot prove that a lower efficiency of stock-line level is universal in connection with the 12-hour shift, nor yet that a substantial improvement in this efficiency would pay the labor bill for an extra crew to work the 8-hour shift, but it has been a result of my observation that the stock-line level is maintained more nearly uniform in the plants that I have seen on the 8-hour shift than in those on the 12-hour shift. This is one of the ways in which the 8-hour shift can help pay for itself, and reduction of the crew in front of the furnace, and better work of this crew, is another way. Of the crew of men filling the furnace only about five out of the six or eight are working the 12-hour shift now. The others, such as the men who keep the ore bins full often work two shifts of 10 hours each.

It will be noted that if sufficient labor was added to put all the blast furnace men now on 12 hours on an 8-hour basis, the increased cost would only be about 30 to 40 cents per ton of pig iron, even if no compensating economies were secured therewith. What are some of the possible economies that might be enjoyed if the change were made?

1. The possible reduction in some of the crews has already been mentioned.
2. So has the increase in fuel efficiency due to more uniform charging of the furnace.
3. The elimination of the "floating gang" would reduce the labor bill.
4. Reduced absences, reduced tardiness, labor turnover, all operate as economies.
5. It is emphatically asserted by blast furnace managers working the 8-hour shift that the higher grade of labor attracted by shorter hours, greater care and alertness, better morale, and more skillful supervision and operation are all reflected in a saving in cost of production, greater regularity of operation and quality of product, less interruptions, less accidents or breakdowns, and less costly repairs to machinery.

As cost figures are highly confidential and cannot be quoted or published these opinions cannot be either supported by me by statistics or figures. In more than one case I have been assured by furnace operators that in their opinion the cost of producing pig iron is less on the 8-hour than it is on the 12-hour shift.

In this connection I am permitted to quote the management of the Ford Motor Co., and say that although the blast furnace operates on the basis of eight hours per day and 48 hours per week per man, and labor is paid 75 cents and upward per hour, as compared with 27 and 30 cents per hour and upward at other plants visited, nevertheless the company makes pig iron cheaper than it can buy it. It attributes this to greater efficiency of labor and of operation.

Peak Loads at Open-Hearth Furnaces

In old-fashioned types of open-hearth furnaces where the charge is inserted by hand labor there is every reason to believe that the number of men employed in three crews working eight hours each would be no greater to do the work than the number employed in two crews working 12 hours each. But the number of these oldfashioned types of open-hearth plants is small, and the relative importance warrants only a brief mention of the circumstance.

At modern plants the peak labor load comes at tapping time which occurs from two to four times per 24 hours. Between these times labor is occupied from time to time, but there are almost always many resting periods during the 24 hours. The "pouring gang" has its work only when the furnaces tap, and the steadiness of occupation of this gang depends on how often the furnaces tap and how many furnaces there are in the plant. This is obviously a matter which should be arranged so as to keep this gang at work most of the time. Then it would not be a serious item of expense to increase their tonnage rate slightly and work them in three shifts, instead of in two shifts with resting periods. The same principle applies to the work of the gang preparing ladles for the "heats", which are the product of the "tap" i. e., the metal from the furnace. The total cost of the pouring gang and the gang that prepares the ladles for the heats is only a few cents per ton of steel, in a large modern plant, and the expertness and care with which they do their work has an important influence on the waste of finished product.

The gang which repairs and relines the ladles may be employed on two shifts of 10 hours each. The "pit gang", that is the gang which keeps the place cleaned up, which removes slag from the pit, disposes of material thrown down, or spilled, has a severe job. The work is hard, and there is danger and often exposure to heat. It has been found possible to decrease the size of the crews on this work when a change is made in their daily hours from 12 to eight.

The last crew is the crew on the charging platform of the furnace. This is the crew which actually makes the steel. Its labor is now greatly decreased by the "charging machine", which not only takes care of putting the steelmaking materials in the furnace but also charges

the flux and ore during the course of the operation, and any pig iron needed for adjusting purposes. Electric appliances have also greatly decreased the work of this crew. For example, the electric appliance for raising the doors of the furnace has eliminated the "pull-up" boy who used to operate the hydraulic or manual appliance; also mechanical appliances for changing valves, etc.

Labor Aided by Appliances

The labor of the tapping operation used to be severe but now oxygen is used to open a "hard" hole. With proper care this leaves the hole in good condition so that the former work of repairing this hole after the tap, while exposed to extreme heat, is now unnecessary. If some work around the hole is needed it can be done by compressed air. The shoveling of recarburizer into the ladle while exposed to the extreme heat radiating from the liquid metal, has been replaced by a mechanical appliance into which the recarburizer is dumped from a wheelbarrow, and which then dumps it into the stream of metal as slowly or as fast as the operator desires. He works the appliance from a distance where he can see all that goes on without being near the heat. The labor of repairing lining after tapping, which was always taxing, and which must be done rapidly to facilitate the regularity of the mill and reduce delays, may now be done by means of a gun which shoots a stream of repair material into the furnace at exactly the point desired.

These labor-saving devices have eliminated all the operations requiring severe physical endurance or exposure to heat. They enable the furnace crew to do its work with less of a tax and with greater speed. They have revolutionized the work on the furnace platform during the past decade.

Formerly it was the custom to shut down open-hearth furnaces every week-end but now they are often run continuously for all the four to seven months of their campaign, with important saving in expense. This introduces the expense of the "floating gang", unless the 8-hour shift is in vogue. And this is only one of the compensating economies which experience with the 8-hour shift has developed at the open-hearth furnaces. This operation is very dependent for its economical conduct on the care, expertness and loyalty of the men.

There is no process in the industry in which the men can more easily save or waste the company's money. If the crew approaches the end of its shift it can easily defer the labor of tapping so that the next crew will have it to do, with consequent delay and loss of money. If a bad "puddle hole" is observed in the bottom it may be ignored or only partially repaired, and a breakout may occur. Care will increase the life of the furnace, economize on lining materials, save fuel, improve quality, avoid "pigging up", etc. It is true that all these expert furnace men are paid on the tonnage basis, so that they have the incentive to exercise their best care and skill, but it is human nature to shirk a little when one is tired out by long hours of work.

Possible Economies in Rolling Mills

Such slight experience as I have been able to collect from those who have employed the rolling mill labor on the 12-hour shift and the 8-hour shift indicates a decided increase of efficiency of the lever men, manifested in increased output, less repairs, and less "cobbles". "Cobbles" are pieces in process which have met with accident and must be scrapped. There is also some compensating economy in the elimination of "spell hands" who take the place of the lever men at intervals in order to give them rest and relief. This relief is necessary on the 12-hour shift but can be dispensed with in part or altogether on the 8-hour shift.

There are many other departments of the iron and steel industry to which only incidental reference has been made in this report for the reason that they are either already operating very largely on the 8-hour shift in general principle, or else because the number of men involved is small in comparison with the blast furnaces, the open-hearth mill and the rolling mills. Thus, some of the labor in the bessemer mills is operated on the 8-hour shift, some on two shifts of 10 hours, each. Puddling mills and crucible steel departments are decreasing in number and the principle of the 8-hour shift is prevalent very largely in them. Some of the finishing departments operate on two shifts of 10 hours each and some operate only during daylight hours. In any event, the finishing departments would probably follow the practice of the prime producers.

The "Floating Gang"

On the two-shift system the men are given a 6-day week by means of the "floating gang", an auxiliary crew of laborers which takes the place of individual laborers in succession for one day each week. This is a great and kindly relief from the old 7-day week system when a man worked 84 hours per week for 52 weeks of the year, but it is open to a great objection on the part of the men. They want the free day on Sunday. On other days of the week they cannot enjoy freedom so much. Only a fraction of the time does the "floating gang" system give each man a Sunday off. While this is primarily a sociological question it has its technical aspect, because it expresses itself in men leaving the work for other industries, large labor turnover, irregularity of work, etc.

The "floating gang" system adds one-seventh, 14.8 per cent to the labor cost of the 7-day week system.

What departments are operated continuously including Sunday? Blast furnaces and open-hearth furnaces are operated most economically if run without cessation until their linings are worn out and they must be shut down for extensive repairs. True, other parts of the open hearth sometimes wear out ahead of the linings, but the roof is included as a part of the lining and the principle we are discussing here applies regardless of which part happens to fail

Arrangement of Hours in Three-Shift System

	First Week			Second Week			Third Week			First Week		
	12N	8am	4pm	12N	8am	4pm	12N	8am	4pm	12N	8am	4pm
	8am	4pm	12N	8am	4pm	12N	8am	4pm	12N	8am	4pm	12N
Monday	1	2	3	.	.	.	.	.	.	.	.	.
Tuesday	1	2	3	.	.	.	.	.	.	.	.	.
Wednesday	1	2	3	.	.	.	.	.	.	.	.	.
Thursday	1	2	3	.	.	.	.	.	.	.	.	.
Friday	1	2	3	.	.	.	.	.	.	.	.	.
Saturday	1	2	2	.	.	.	.	.	.	.	.	.
Sunday	3	3	1	.	.	.	.	.	.	.	.	.
Monday	.	.	.	2	3	1	.	.	.	.	.	.
Tuesday	.	.	.	2	3	1	.	.	.	.	.	.
Wednesday	.	.	.	2	3	1	.	.	.	.	.	.
Thursday	.	.	.	2	3	1	.	.	.	.	.	.
Friday	.	.	.	2	3	1	.	.	.	.	.	.
Saturday	.	.	.	2	3	3	.	.	.	.	.	.
Sunday	.	.	.	1	1	2	.	.	.	.	.	.
Monday	.	.	.	.	.	.	3	1	2	.	.	.
Tuesday	.	.	.	.	.	.	3	1	2	.	.	.
Wednesday	.	.	.	.	.	.	3	1	2	.	.	.
Thursday	.	.	.	.	.	.	3	1	2	.	.	.
Friday	.	.	.	.	.	.	3	1	2	.	.	.
Saturday	.	.	.	.	.	.	3	1	1	.	.	.
Sunday	.	.	.	.	.	.	2	2	3	.	.	.
Monday	.	.	.	.	.	.	.	.	.	1	2	3
Tuesday	.	.	.	.	.	.	.	.	.	1	2	3

first. This means a continuous campaign of some months in the case of the open hearth, and of some years in the case of the blast furnace. In the bessemer mill, the rolling mill, the several finishing departments, the tinning mill, the galvanizing department, the wire drawing department, etc., it is the custom, on the contrary, to discontinue the manufacturing operation from Saturday afternoon to about Sunday night.

During this interval the repair gang may be very actively engaged, but the operating men at least have their Sunday free. For these men, therefore, the question of 7-day week, "floating gang", etc., does not enter. In discussing the subject we shall confine ourselves to the blast furnaces and open-hearth mill. These are the two great producing departments in the sense that one produces practically all the pig iron, and the other the greater part of the steel made in the country. The total number of men employed in these two departments is, however, but a fraction of the total iron and steel laborers.

Sunday Holiday by Three-Shift System

The three-shift system gives every man an opportunity to enjoy his church and his family on Sunday without involving the expense of the "floating gang", or the waste due to shutting down the open-hearth furnace at the weekend. One method of arranging the hours so as to accomplish this is shown in the accompanying table.

This may be explained as follows:

Crew No. 1 works from midnight to 8 a. m. the first week; from 4 p. m. to midnight the second week; from 8 a. m. to 4 p. m. the third week.

Crew No. 2 and Crew No. 3, work the other hours, as shown.

When the weekend change of shift occurs:

Crew No. 1 gets from 8 a. m. on Saturday until 4 p. m. on Sunday free, 32 hours. This crew has all day Saturday, and all Sunday until 4 p. m. to be with family or to go to church, or both. Each crew enjoys this freedom every third week.

Crew No. 2 gets from midnight on Saturday until midnight on Sunday.

Crew No. 3 gets from 4 p. m. on Sunday until 4 p. m. on Monday. This gives it Sunday afternoon after 4 and all Sunday evening for church and family.

The week-end system described gives one crew longer daylight hours of work on Sunday than either of the other crews, but each crew takes this shift in succession, so it comes only once every three weeks for each man. It can be varied, if desired, so that crew No. 3 comes to work at 10 p. m. on Saturday and quits at noon on Sunday. Crew No. 1 relieves it at that time. Other variations are possible, according to which suits the men themselves best. By this system each man works 56 hours per week.

Twice in every three weeks each man works one continuous shift of 16 hours. This is severe, but not nearly as much so as working 12 hours a day for six days, and is a great improvement on the 24-hour week-end shift which it replaces. A 16-hour shift has not proven in practice to be exhaustive when the men work only 56 total hours a week, and when it is either preceded by 32 hours of rest or else followed by 24 hours of rest. The 24-hour shift is followed by only 12 hours of rest, and it comes every second week instead of every third week.

Adopting Standards for Machine Tools

(*Concluded from Page* 919)

likely that automobiles or other machinery would be more highly developed if each builder used a special sized nut with a special thread? Standardization of such parts as nuts, prison pins and other parts simply means that the designer calculates his requirements, such as to the kind of loads and stresses and selects the standard part which meets his needs, instead of designing an entirely new nut or pin of a slightly different size. It must be remembered also that standards are not as fixed permanently, but can be changed whenever occasion really demands.

While all our efforts at standardization at this time should be devoted to such details of machine tools as affect the user, such as the work-holding and tool-holding devices as has been pointed out, it is probable that the machine tool builders themselves may find further standardization desirable. Research may show that bearings of certain dimensions are best for given spindle loads and speeds. Designers then would determine the load to which the spindle of a new machine would be subjected, and after considering all the conditions, would select the proper bearing from a list of standards. This would simplify manufacture and greatly reduce the number of tools and gages to be carried in stock as well as stock of bearings themselves.

In addition to the engineering and economic aspects of machine tool standardization, there is the adoption phase. For all practical purposes this is a selling problem. The best engineers of the United States or of the world for that matter, may gather in conference and decide that certain standards shall be established but they have no power to do anything more. If the manufacturer concludes that his present practice is sufficiently satisfactory and he is not convinced of the need for innovations there is little that the standardizers can do.

Often the problem is essentially a selling problem and one for which the average engineer is temperamentally unsuited. Diplomacy, tact, persuasiveness, the stock-in-trade of the salesman are needed at this stage of the game. Even they would be futile if no means were at hand for gathering together the men who must make sacrifices if a standard is to be adopted, for lacking such means the task of reaching each man individually and reconciling his views with those of all the others, would be herculean.

The machinery for handling the engineering and industrial problems connected with this phase of standardization already exists in the American Engineering Standards committee, and the rules of procedure of this committee are designed to bring about the early adoption of approved American standards. To this end all sectional committees are required to include in their personnel representatives of all organizations which are in any way interested in the manufacture or use of the standard under consideration. Since these organizations are officially represented on the committee which prepares the standard, it is obvious that the members of these organizations are committed to the adoption of the standard to the extent that any individual or firm is committed by the actions of an organization to which he or it belongs. Just how well this arrangement may work out when it comes to universal adoption of a standard, it is too soon to say, but at least the plan shows promise.

It may be that the division of simplified practice of the department of commerce recently organized by Secretary Hoover will have a part to play in securing the general adoption of the standards for small tools and machine tool elements which are to be developed by the sectional committee sponsored jointly by the National Machine Tool Builders' association and the American Society of Mechanical Engineers. This, of course, will be determined as the work of the committee progresses.

So far the division has done its best work in fields of industry not closely connected with engineering. It is co-operating, however, to the fullest extent with the American Engineering Standards committee in furthering the establishment and introduction of standards.

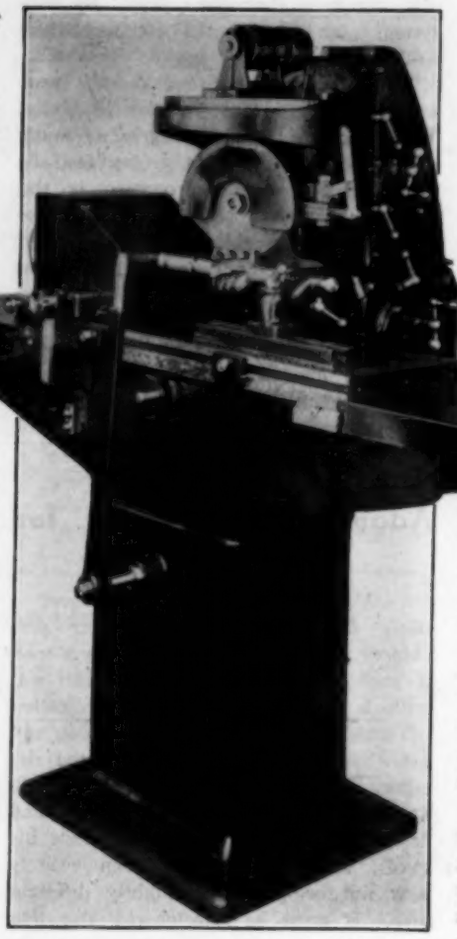
Standardization is a tremendous job and it may prove to be one beyond the capacity of any standards body yet organized. But it is a job that must be done and some means will have to be found. For the present, existing agencies should be given the fullest possible support by the manufacturer or user. Whatever is accomplished will benefit everyone and is well worth any sacrifices that may have to be made.

Develops New Design for Plate Planer

A new design for its line of plate planer has just been effected by the Niles-Bement-Pond Co., 111 Broadway, N. Y. The principal change is in the design of the bed and the method of attaching the carriage to the bed. The primary object of the new design is to prevent chips from getting on the bearing surfaces of the carriage and screw. As shown in the accompanying illustration, the tool carriage is attached to the front vertical side of the bed and is guided by square shears. It is secured top and bottom by removable bearing supports which will permit the carriage to be taken from the bed at any part of its length. Bearing surfaces are provided with taper gibs for taking up wear.

Two relieving tool holder slides are mounted on a standard and have simultaneous vertical adjustments by means of a screw and handwheel and horizontal adjustment to the standard through screw and handwheel. Both tool slides have swiveling features to permit the planing of bevels. The drive screw is supported in a trough with an oil channel of sufficient depth to cover the full thread with oil. Roller bearings take up the end thrust of the screw. The pneumatic jacks are of the two-way type, air being admitted at the top for clamping the plate and at the bottom for unclamping.

The carriage is reversed automatically at any position by contact with stops adjustable on the shifter rod. By manipulating this rod the operator can start, stop or reverse the machine may be started and stopped without manipulating the shifter rod.



SEMIAUTOMATIC MACHINE FOR GRINDING HOBS AND FORM CUTTERS

Builds Grinding Machine for Hobs and Cutters

A new semiautomatic hob and form cutter grinding machine for use in shops where the number of hobs to grind does not warrant the purchase of a more expensive automatic machine, recently has been introduced by the Harris Engineering Co., Bridgeport, Conn. A view of the machine is shown in the accompanying illustration. The hob or cutter to be sharpened is carried on an arbor with a taper shank fitting into the work carrying spindle. The outerboard end of the work is supported by a center in an adjustable tail stock. The spindle and the tail stock are carried on ball roller bearing table operated by a hand lever. Hobs having helical flutes are rotated during the travel by a sine bar adjustable to different angles.

The index plates are interchangeable with those of the automatic machine made by the same company. The indexing mechanism is semiautomatic and operates only at the end of the return stroke. The grinding wheel spindle is driven by an endless open belt without twists or idler pulleys. The entire wheel head is of heavy construction and provides for all necessary adjustments. An important feature is the diamond truing device for dressing the wheel, which is built into the head and may be used when the machine is in operation without disturbing the work. The hob is fed against the grinding wheel by a handwheel turned by the operator.

Tests Nitrogen in Steel

Preliminary tests by the bureau of standards on a new method of determining both combined and uncombined nitrogen in iron and steel confirms the belief that the method will make more certain the determina-

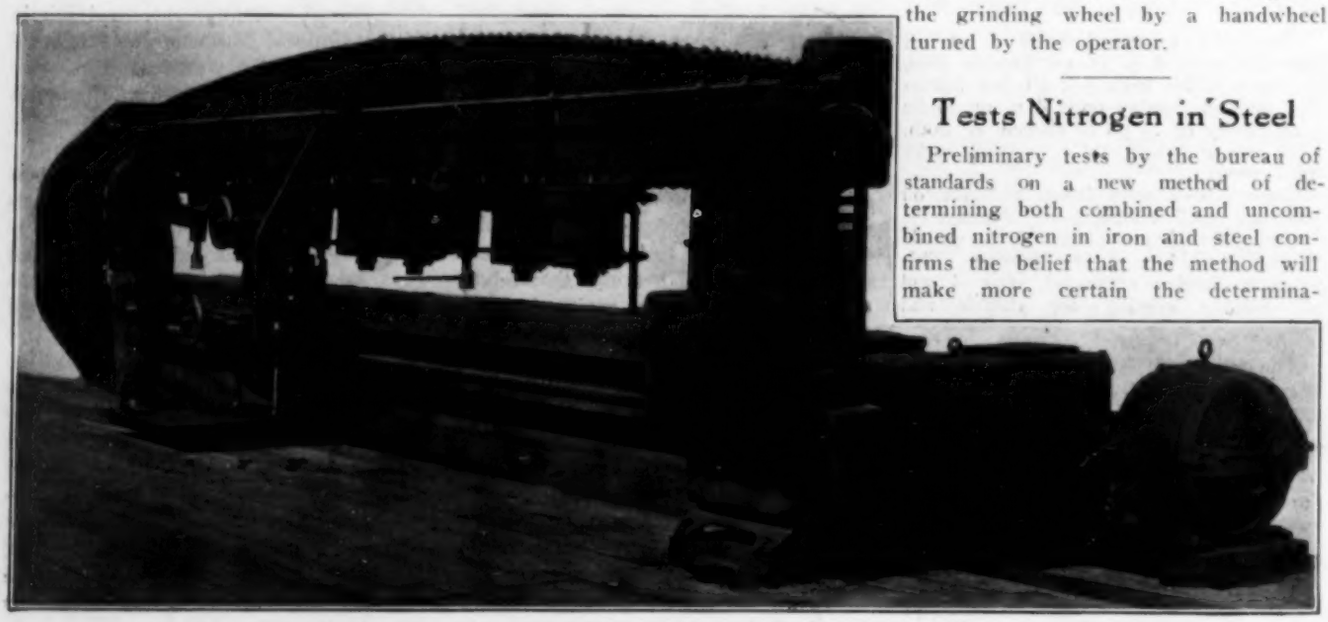


PLATE PLANING MACHINE SHOWING THE METHOD OF ATTACHING THE CARRIAGE TO THE BED

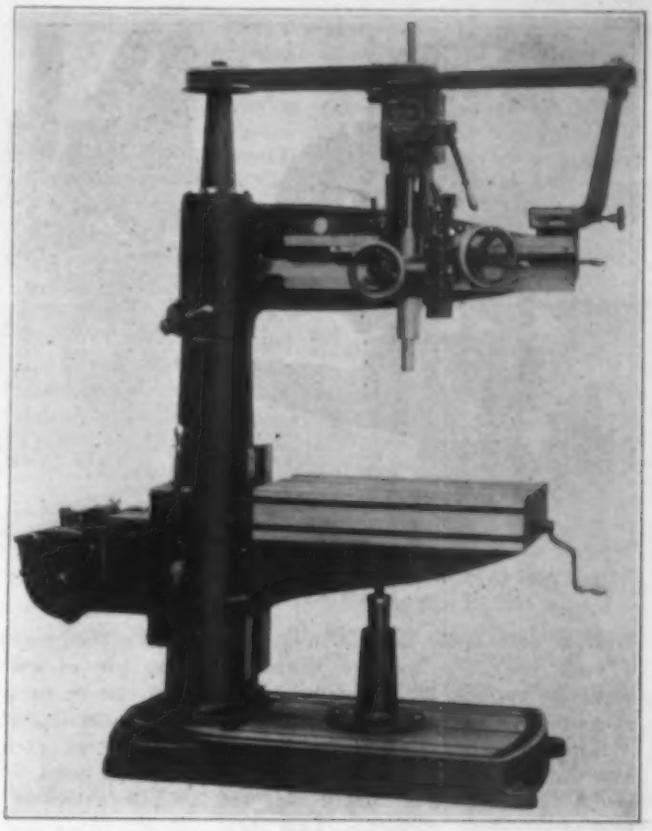
tion of uncombined nitrogen in steel, namely the nitrogen not determined by the Allen method. The new method depends on the absorption in calcium vapor of all gases involved in the steel sample when fused in vacuo. The nitrogen is fixed as calcium nitride which is readily determined by a solution of acid and distillation with sodium hydroxide.

Device Dresses Grinding Wheels with Safety

Since many operators claim that satisfactory results cannot be obtained except by hand method of wheel dressing, the Pratt & Whitney Co., 111 Broadway, New York, has introduced for use on its machines a new style dresser giving all the advantages of hand dressing without danger of injury to the operator. As shown in the accompanying illustration, the device consists of a bracket bolted or riveted to the wheel guard which supports the stem of the dresser. The dressing wheels are held in one end of the device, the bar being bent to fit under the wheel. The other end forms a handle so that the attachment can be moved easily into position. No change in the work and wheel relation is necessary. The dresser may be applied to grinders now in use and is furnished as regular equipment on new machines.

Sensitive Radial Drill Is Built for Speed

For drilling and tapping work of too heavy a nature for a high speed sensitive drill and too light for a heavy duty radial drill, the Fosdick Machine Tool Co., Cincinnati, has brought out an intermediate size of sensitive radial drill. It is claimed that the rapidity of positioning the drill together with convenience of operations minimizes the time between holes, while high speeds and excess power reduce the actual drilling time. A side view of the drill is shown in the accompanying illustration. The table is removed readily, allowing 49½ inches between the spindle and base, has a working surface of 28 x 36 inches and is provided with T-slots. Vertical movement of the table is 16 inches through a ball bearing telescope screw. The arm, which is sensitive in its movement, may be swung completely around the column and is supported on both annular and thrust ball bearings on the column which extends through to the top. Vertical traverse of the spindle is 8 inches, and the horizontal movement of 28½ inches along the arm is through a rack and spiral gear with a handwheel at the right.



SENSITIVE RADIAL DRILL WHICH HANDLES TAPPING AND DRILLING WORK OF MEDIUM DUTY

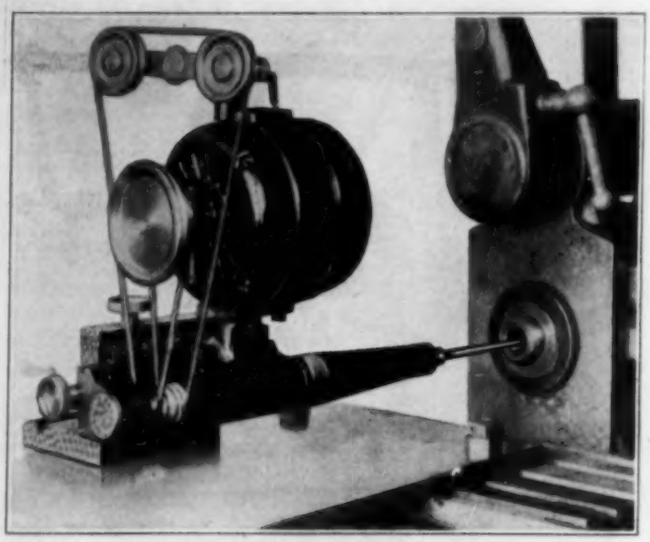
Friction back gears, said to be a new feature for a machine of this type, permit quick shifting from high drilling speeds to slow speeds for tapping or drilling larger holes, the ratio being 4½ to 1. Drive is through tight and loose pulleys although provision is made for the application of 1-horsepower constant or variable speed motor. A reservoir for cooling material is cast in the base. A pump with a nozzle may be supplied.

ATTACHMENT FOR DRESSING SURFACE GRINDING WHEELS SAFELY

Production of Feldspar Decreases in 1921

The United States geological survey report of crude feldspar mined and sold in the United States in 1921 shows a decrease of 32 per cent in quantity and 27 per cent in value as compared with the production in 1920. The output for 1921 also was smaller than for any other year since 1912 with the exception of 1918 and 1919, when the activities of the industries consuming feldspar were curtailed on account of the war.

On account of the record production in 1920, which was apparently in excess of the demands, together with the growing production in Canada and the depressed condition of the domestic ceramic industries, the production of feldspar in the United States in 1921 was less than normal. In 1920 there were 135,551 long tons purchased valued at $851,123 in comparison to 91,865 tons valued at $617,652 in 1921. The average value of all



THIS EXTENSION HOUSING AND SPINDLE FACILITATES DEEP GRINDING

feldspar sold crude in 1921 was $6.62 a long ton. The average values as reported by the individual producers ranged from $3 to $11.18 a long ton.

Notwithstanding the business depression in the feldspar industry, considerable increase was noted in the feldspar-grinding capacity. Two new mills were established at Johnson City, Tenn., and a third at that place has been remodeled. New mills for grinding Canadian feldspar were established at Rochester, N. Y., Cleveland and Toledo.

Foundry Expert Aids in Solving Problems

During July and August, R. E. Wendt of the engineering department of Purdue university, Lafayette, Ind., visited 57 foundries in Indiana and interviewed 100 foundrymen in an effort to assist in the solving of foundry problems. Mr. Wendt is an expert of extensive practical experience and has charge of the foundry department of the university. The trip was arranged in connection with the engineering extension work offered by the school, the foundry program having been extended recently to include the foundries of the state. As a result of Mr. Wendt's visits, many of the foundrymen announced themselves in favor of holding a conference at the university next spring. A number also expressed their willingness to take students into their plants during the summer vacation period.

Places Spindle Extension on Thread Grinder

An attachment for all models of precision thread grinders for grinding to a depth of 12 inches on holes of 2 inches or greater in diameter and 6 inches on holes of ½ inch in diameter, has been introduced by the Precision & Thread Mfg. Co., 1 South Twenty-first street, Philadelphia. A view of the attachment is shown in the accompanying illustration. The extension spindle as shown in the illustration is especially applicable on the operation of grinding the tapered bore in a milling machine spindle, where perfect concentricity of the bore promotes full service and long life of cutters. The attachment also can be used to true lathe spindle bores occasionally, thus avoiding truing the centers each time that the machine is used.

The extension housing can be attached easily and accurately by screwing the projection threads on the front regular spindle cap. The extension spindle couples on to the regular spindle by the tapered fitting joints, and is supported at the working end by radial and end thrust ball bearings located at the extreme end of the extension housing.

Builds Crane and Shovel of Caterpillar Type

For general use including the handling of coal, ore, limestone, etc., the Orton & Steinbrenner Co., Chicago, has introduced a new combination steam crane and shovel of the continuous tread principle. A feature of the machine, which is shown in the accompanying illustration, is that by a quick change of the crane boom for a shovel boom and dipper; the crane is converted from a clam shell rig to a steam shovel. When a skimmer scoop is desired it is unnecessary to change the crane boom as a separate boom can be connected to the crane independent of the main boom.

BY CHANGING BOOMS, THIS SHOVEL MAY BE CONVERTED TO A CRANE

Instead of being fixed at a certain degree, the radius of the boom may be varied to suit the conditions of the job. This feature enables the machine to dig several feet below the normal operating level and also increases the lift. Motive power is supplied by two engines. The hoisting, swinging and traveling operations are performed with double clutches by the main nonreversing engines, while the crowding motion of the dipper is obtained from a separate reversing engine placed midway along the boom. The rotating base turns on a ring of live rollers on a large diameter rail circle. The car body is built of structural steel shapes and plates reinforced and riveted together. The crawling tread is of the flexible type, adjusting itself automatically to the contour of the ground. The tread links are so designed that in passing around the sprockets, all foreign materials adhering to them are thrown off.

Studies Boiler Plate

Tests for the determination of gases in samples of boiler plate which failed from caustic embrittlement, were conducted recently by the bureau of standards, Washington. One sample was taken from a boiler that had been in service for several years, and the second from a boiler in service only a few months. Analysis for gases were made on samples representing the material from the center of the plate where no cracks had developed and from the edge of the plate between rivet holes where cracks had developed. Little variation was found between the combined nitrogen content of the center and the edge of the same plate and between different plates. The test for oxygen and hydrogen by the vacuum fusion method with antimony tin alloy indicated 0.02 to 0.03 per cent oxygen and 0.002 to 0.003 per cent hydrogen in the plate.

Iron and Steel Course To Begin Oct. 12

Final arrangements are being completed for the nontechnical iron and steel course which will be given by the Industrial Association of Cleveland beginning Oct. 12 and continuing for 16 weeks. The program as published in the Aug. 31 issue of THE IRON TRADE REVIEW has been further completed by the addition of Dr. John S. Unger, research director, Carnegie Steel Co., Pittsburgh, to the list of speakers. Dr. Unger will make the concluding address of the course speaking on the subject of "Future Possibilites of the Industry". A list of the motion pictures that have been produced by the government and industrial companies has been secured and a selection made from these from the standpoint of their educational value. A man of high position in the iron and steel industry will speak at the opening session. Several companies have held meetings of their sales staffs with the object of acquainting the employes with the value of the course. The textbook to be used is the *A. B. C. of Iron and Steel.*

The industrial association is organized as an alliance of employers and employes to develop right relations in industry. Lectures are given every Tuesday night on civic affairs, labor relations, etc. New club rooms and executive offices have been secured at 335 Euclid avenue, Cleveland.

Demand for Engineers Is Evidence of Business

The general improvement in the business situation is measured in the increased demand for engineers of all classes, according to figures compiled by the free employment service for technical men and trained executives, conducted by the four national engineering societies, civil, mechanical, electrical and mining. During the first six months of 1922 the number of applications for engineers and trained executives listed with this bureau numbered 1737. This compared with 1551 applications from employers during the entire year, 1921. The number of men placed in the first six months of 1922 numbered 1211, as compared with 1365 during the entire year 1921.

An analysis of 1922 figures shows a steady employment each month. In June there were 106 per cent more placements than new registrations. The bureau, which operates with the assistance of a volunteer committee of 25 leading engineers, is managed by W. V. Brown, and has headquarters at the United Engineering society's building, 29 West thirty-ninth street, New York.

Selects Board To Handle Government Patents

An interdepartmental board to handle inventions evolved by government employes on government time has been set up at Washington. The board also will undertake to disseminate information concerning patents owned or controlled by the government. Dr. S. W. Stratton, head of the United States bureau of standards, is the representative of the department of commerce on the board. Other members are Harry E. Knight, United States department of justice; Dr. Andrew Stewart, United States department of the interior; Lt. Col. J. I. McMullen, United States war department; and Dr. R. C. Tolman, United States department of agriculture.

Builds Large Car Ferry

The Dravo Contracting Co. Pittsburgh, has started work at the Neville Island boatyards on the construction of one of the largest steel boats ever built in the Pittsburgh district, it was announced recently. The boat, which will be known as the G. H. WALKER, is to be used as a ferry by the New Orleans, Texas & Mexico railroad. It will be used to transfer cars across the Mississippi river betwen Baton Rouge and Anchorage, La. The boat when complete will be 340 feet long, 90 feet in beam over the guards, 56 feet in molded beam and 11 feet in depth.

Experiment on Combustion of Metallurgical Coke

Engineers at the southern experiment station of the federal bureau of mines at Burmingham, Ala., are studying the combustion of metallurgical coke at blast furnaces. The bureau states that analyses have been made on gas samples from different parts of the hearth in the plane of the tuyeres at six furnaces in the Birmingham district. It has been found that combustion is complete at a horizontal distance of 3 to 4 feet from the tuyeres, irrespective of hearth diameter, amount of wind blown, or character of the coke. These results show a different condition of affairs from that generally believed to exist. The work is to be continued at several northern furnaces operating on Pennsylvania and Illinois coke.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

THE American Gear Manufacturers association will hold its semiannual meeting at the Drake hotel, Chicago, Oct. 9 to 11. A program has been outlined which in addition to reports of committees and routine business, will include a number of addresses, among which will be: "The Evolution of the Gear" by George L. Markland, Jr., Philadelphia Gear Works, Philadelphia; "Apprenticeship" by P. C. Molter, the National Metal Trades association; "What the Association Needs from Committeemen, After Nearly Six Years Secretarial Observation." by Frank D. Hamlin, Vice President, Earl Gear & Machine Co., Philadelphia; "Why Buy a Pig in a Poke?" by L. G. Hewins, Sales Manager, Van Dorn & Dutton Co., Cleveland; "Standardization of Gear Sounds" by Prof. Daniel L. Rich, University of Michigan, Ann Arbor, Mich.; "Engineering Research" by Prof. A. E. White, University of Michigan, Ann Arbor, Mich. An informal banquet will be held on Tuesday, Oct. 10, the toastmaster being John B. Foote, Foote Bros. Gear & Machine Co., Chicago. The speakers on this occasion will be Marcus Kavanagh, judge, superior court of Cook county, Illinois, who has announced as his subject "Business Man and Law Enforcement"; and Gen. John Clinnin.

Convention Calendar

Oct. 2-7—American Society for Steel Treating, exposition and convention at the General Motors Co. building, Detroit. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Oct. 9-11—American Gear Manufacturers association semiannual meeting at Chicago. T. W. Owen, 2443 Prospect avenue, Cleveland, is acting secretary.

Oct. 9-14—American Mining congress, twenty-fifth annual convention, new auditorium Cleveland. J. F. Callbreath, 84 Munsey building, Washington, is secretary.

Oct. 18-20—Society of Industrial Engineers, national convention and exhibition at the McAlpin hotel, New York. George C. Dent, 327 South La Salle street, Chicago, is business manager.

Abandon Merger

Plans of Midvale, Republic and Inland—Financing Is Hindrance

Plans for consolidation of the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co. and the Inland Steel Co. into a corporation the North American Steel Co. have been abandoned as the result of a conference of the leading figures in this deal proposed merger on Sept. 28. It is understool the question of financing was the obstacle as the bankers are reported to have been unwilling to guarantee the new securities because of the opposition raised by the federal trade commission which has been carrying on an investigation into the proposed combination for several months.

The following statement was given out at the office of T. L. Chadbourne, legal advisor to the companies in the proposed merger:

"W. E. Corey, chairman of the board of the Midvale Steel & Ordnance Co.; John A. Topping, chairman of the board of the Republic Iron & Steel Co. and L. E. Block, chairman of the Inland Steel Co. have authorized the following statement:

" 'At a meeting held today the entire situation arising from the action of the federal trade commission was reviewed and the conclusion was reached that under existing circumstances, it is not possible to proceed with the proposed merger of the Midvale Steel & Ordnance Co., the Inland Steel Co., and the Republic Iron & Steel Co. While all of the eminent counsel who have been consulted agree that the proposed merger would be legal in every respect, and while the consummation would not have restrained but have itensified competition, the final determination of the questions involved would delay the carrying out of the plan to such an extent, that the parties in interest do not deem it advisable to proceed. Pending such fiual determination of the questions involved, the financing of the proposed merger would not be possible and it is not feasible to proceed with the merger without such financing.' "

Collapse of the merger project is believed to mark the definite conclusion of the protracted negotiations began about a year ago and which originally involved eight companies: The Midvale Steel & Ordnance Co., the Youngstown Sheet & Tube Co., the Brier Hill Steel Co., the Trumbull Steel Co., the Republic Iron & Steel Co., the Inland Steel Co., the Lackawanna Steel Co., and the Steel & Tube Company of America. The various companies involved, for one reason or another, fell out of the project until only three were left. With the failure of the final 3-party merger project, the situation remains as it was before the negotiations were begun, excepting that the Lackawanna Steel Co. has been acquired by the Bethlehem Steel Co. and as a result of the approval by the Bethlehem and Lackawanna stockholders on Sept. 18, both these companies now are operating under the Bethlehem management.

Eugene G. Grace, president of the Bethlehem Steel Corp., pointed out that the abandonment of the Republic Midvale-Inland merger plan will in no way effect the acquisition of the Lackawanna company by Bethlehem. Mr. Grace issued the following statement:

"The decision of Midvale, Republic and Inland not to merge should have no significance whatever for persons interested in our acquisition of Lackawanna," said Mr. Grace. "The Bethlehem-Lackawanna combination already is virtually a fact, and the last step, the actual exchange of securities, will be made just as soon as possible, presumably within the next two or three weeks. The stumbling block for Midvale, Republic and Inland, floating securities of a new company in the face of a federal trade commission complaint, we have not had to contend with and will not have to contend with at any time. The additional $15,000,000 preferred stock for plant improvements, which it is planned will be a regular Bethlehem security, will be beyond the pale of any federal trade commission action."

The Lackawanna Steel Co. announces that it will close its books Oct. 9 for the purpose of taking a record of its stockholders to be turned over to Bethlehem in order that the latter can exchange its securities for those of Lackawanna.

Brier Hill Sheet & Tube Merger Off

The Brier Hill Steel Co., Youngstown, O., will at once proceed with the completion of its plans to build additional finishing departments, Chairman James B. Kennedy announced after a statement was issued by President James A. Campbell of Youngstown Sheet & Tube Co., declaring that there will be no merger between the two concerns.

President Campbell's statement was concurred by Mr. Kennedy. It reads as follows:

"There has never been any official proposition made, either by the Brier Hill Co. to sell its property to the Youngstown Sheet & Tube Co., or by the Youngstown Sheet & Tube Co. to acquire the property of the Brier Hill Co.

"There have been informal talks between some of the stockholders of Brier Hill and myself in reference to an exchange of stock of Brier Hill for Sheet & Tube, and inasmuch as the Brier Hill Steel Co. contemplates making additions to its property, it was thought advisable by me to call a meeting of our directors to give the matter serious consideration.

"Brier Hill Steel is a splendid property with valuable ore and limestone properties, and new and up-to-date blast furnaces, steel plant and finishing mills, but it is not so well balanced as it might be, but with some additions in finishing capacity it can be made a very strong and well rounded out property. Our directors, however, were of the opinion that we should not further increase our investment in this district."

Fougner Sells To Kalman

Herman Fougner, announces that he has sold the business of the Fougner Concrete Steel Co., New York, to the Paul J. Kalman Co., Chicago. The Fougner company will carry out the contracts now on its books but eventually the entire business will be carried on under the name of the Kalman company. L. O. Helgesen, formerly in charge of the northwestern business of the Kalman company, with headquarters at Minneapolis, has been appointed New York manager of that company. New York offices of the Kalman and Fougner companies are being maintained at 29 Broadway, but about Oct. 15 will be moved to 110 East Forty-second street.

Approve Alloy Merger

Stockholders of the Electric Alloy Steel Co. at Youngstown have voted unanimously to approve merger with the Atlas Crucible Steel Co., Dunkirk, N. Y., under the name of the Atlas Steel Corp. Youngstown offices of the Electric Alloy Co. have been closed and executive offices of the new company opened at Dunkirk. Lewis J. Campbell of the Electric Alloy Co. is to become chairman of the board.

Arranges Ore Carriage

The Bethlehem Steel Corp. has placed a contract with Axel Brostrom & Sons of Gothenburg, Sweden, for the transportation of ore from Chile to Atlantic ports over a period of 20 years. Eugene G. Grace, president of the corporation, in commenting on this deal, said that a similar contract was concluded in 1914, but not enforced because of the outbreak of the war. For transporting the ore, the Swedish company has ordered two new vessels. The latter will be built by the Deutschwerke, Hamburg, and will be delivered early in 1923. They will be of 21,000 deadweight tons, making them the biggest cargo carriers ever built. Burmeister & Wain diesel engines of 6000 horsepower built by the Allgemeine Electricitats Gesellschaft will be installed. The Bethlehem Steel Corp. has four vessels of its own in the Chilean ore trade and is building two more.

Considers Standards for Bolts and Wrenches

Washington, Oct. 3.—The National Screw Thread commission has before it the report of the subcommittee on bolt heads, nuts and wrenches. This report will be considered at the next meeting of the commission, some time in October, at Chicago or Pittsburgh. The recommendations of the subcommittee, of which F. O. Wells is chairman, follow:

"1. Bolt heads and nuts.

(a) Bolt heads, nuts, and cap screws shall conform in short diameter and thickness to the U. S. standard for coarse threads and to the S. A. E. standard for fine threads, modified as shown in columns 3 and 4, Table 1, National Screw Thread commission, No. 39.

(b) The maximum width across the flats, short diameter, shall be basic size and this maximum width shall apply to finished, semifinished, and rough hexagonal and square bolt heads and nuts.

(c) Tolerances on all bolt heads, nuts and cap screws shall be minus and in amount as follows:

Bolt size, inches	Tolerance, inches
¼-½	0.005
⅝-1	0.008
1⅛-2	0.010
2¼-3	0.012

"The allowances and tolerances on openings of wrenches shall be plus and in amount as follows:

Bolt size, inches	Allowance, inches	Tolerance, inches
¼-1	0.002	0.005
1¼-2	0.004	0.008
2¼-3	0.006	0.010

"2. Machine screw heads.

(a) Standard designs of machine screw heads shall be limited to the following: 1. round head; 2. flat head countersunk (82 degrees); 3. oval ter head (82 degrees); 4. round fillister head.

(b) The length of the screw shall be defined as the distance from the largest diameter of the bearing surface to the extreme end.

(c) The form and size of head shall conform to forms and dimensions derived from formulae of A. S. M. E. except for size of slot which shall be as follows:

Size of screw, inches	Width of slot, inches	Depth of slot, inches
0-2	0.024	0.020
3-6	0.030	0.040
8	0.042	0.050
10-12	0.051	0.060

"With reference to square and hexagonal stock it has been suggested by members of the commission that the effort should be to assist in establishing the practice of having all screw stock run from basic to below basic instead of basic plus or minus. The tolerances and allowances proposed for wrenches are to apply only to open-end wrenches; socket wrenches are to be considered separately.

"Maj. J. O. Johnson's subcommittee on special threads has recommended that a conference be held with manufacturers and users of conduit threads. To carry out this idea the October meeting of the commission is to be held in either Chicago or Pittsburgh and the November meeting in New York City.

Canadian Iron and Steel Production Less

The report of the Canadian bureau of statistics on iron and steel production states that the output of pig iron in August was 27,123 gross tons, as compared with 31,705 tons in July, being a decrease of 14.45 per cent. The principal grades produced were 20,494 tons of basic pig for further use and 6296 tons of foundry iron for sale. Fifty-two tons of foundry iron was made for further use and 281 tons of malleable iron was produced for sale. The ferroalloy production was 1864 tons as compared with 1809 tons in July.

Steel production was 59,201 gross tons as compared with an output of 62,767 tons during the previous month, a decrease of 5.68 per cent. Of the total output 56,997 tons were open-hearth basic ingots intended for further use and 2204 tons direct steel castings of which 1128 tons were bessemer castings. Castings made in electrical furnaces for sale were reported to the amount of 738 tons and 130 tons were manufactured for future use.

May Tax More Imports

Washington, Oct. 3.—Consul Jewell at Birmingham, England, has informed the department of commerce that a movement is on foot to levy a duty of 33 1/3 per cent upon imports of enamelled and hollow ware. Birmingham makers contend they are being injured by German competition. Some makers fear 33 1/3 per cent will not be sufficient to keep out the German product.

Minerals Show Decrease

Mineral products valued at about $4,056,000,000 were produced in the United States in 1921, according to a report just issued by the United States geological survey on "Mineral Resources in the United States in 1921". The production in 1921 shows a decrease of more than 40 per cent over the previous year when the value of mineral products was $6,951,410,000. This decrease is not due alone to the lessened production, but also to the lower unit value for most minerals. The depression caused the production of coal to drop back to the level of 1911, while the output of by-product coke was the smallest since 1916, and that of beehive coke the smallest since 1885. The output of iron ore was the lowest since 1904, causing a corresponding decrease in the demand for ferroalloys, fluxes and refractories.

Gives More Data on Iron and Steel Imports

Washington, Oct. 3.—Enactment of the Fordney-McCumber tariff act will be reflected in increased detail of import statistics of the department of commerce. The new schedule of import classifications, modeled after the classifications of the new tariff act, has been completed. This increased detail will come with the October import statistics, which will be available about Dec. 1.

The great number of classifications of the Fordney-McCumber act will more than triple the import statistics. The present classification of muck bars, bar iron, round iron in coils and the like will be enlarged nine times because the act provides for nine step-ups in rates based upon value. The monthly reports of the department will give the imports as a whole, and quarterly the department will announce the imports for each class.

The wire rod classification has been broken up into these four items: Rivet, screw, fence and all other iron and steel wire rods; tempered or treated wire rods; cold-rolled, cold-drawn, cold-hammered or polished wire rods; and galvanized or coated with metal. For each of these four classes imports will be given for value not over 4 cents per pound and over 4 cents per pound.

The ferrosilicon imports will be given for four classes, from 8 to 59, from 60 to 79, from 80 to 89, and 90 per cent and over silicon. The protection granted to the alloy steels will make necessary a division of these steels from the ordinary ones. Other classifications have been treated similarly, and it is expected that the new schedule will give imports in more detail than are now available in any country.

As of last Jan. 1 the export classifications were greatly broadened. The next step in Secretary Hoover's program of making available more trade data is the transfer of the bureau of customs statistics from the treasury department to the department of commerce. This would speed up the statistics.

Lebanon Mill Started

The Bethlehem Steel Co. recently began operating the 12-inch mill at its Lebanon plant and the bars from this mill will be used for the company's own manufacturing requirements. The company is getting the 8-inch mill at the Lebanon plant ready to operate.

Need Lower Costs

To Resume Work at Broken Hill Proprietary Co.'s Plant

Newcastle, N. S. W., Australia, Sept. 21.—Directors of the Broken Hill Proprietary Co., Ltd., have issued a statement explaining the conditions under which they will be able to operate their iron and steel plants here, outlining prices of coal, wages and hours of work that will be necessary to enable them to compete with foreign trade.

Referring to working hours, the directors say that great disadvantage is incurred through the 44-hour week. It is stated that 48 hours of work is the only solution of the labor problem. The basic wage in New South Wales is £3 18s ($17.47) per week and the directors say that they are unable to proceed at this figure. If wages are reduced to £3 10s ($15.68) furnaces will be relighted. The reduction is said to be the very least required by the company to enable it to meet foreign prices and to get Australian orders for steel. The company also proposes to lower salaries of staff and technical men and to improve methods. It asks for lower freight rates.

The coal used is principally that required for the manufacture of coke. The cost of the coal at Newcastld in 1921 was 37 shillings 4 pence per ton ($8.36). The present price of small coal is 17 shillings 9 pence ($3.97). However, small coal is not delivered in sufficient quantities and the cost of coal for coke making is 19 shillings 3 pence ($4.31) per ton.

It is reported that there is a sufficient tonnage of rails at the works now to supply Australian requirements for 12 months.

With the closing of the Broken Hill works some weeks ago all of the associated industries ceased operations. Many coal mines work only half the time. Workmen are demanding that companies disclose their profits. The two forces are opposing one another to the detriment of at least 80,000 persons in the New South Wales district. In the four weeks ending June 21 the steel foundries of the Broken Hill company produced 21 tons of castings. This was the total output for the company in that period. Advantage has been taken of the idleness of the works to make repairs.

Imports into Australia for May were as follows: Pig iron, 963 tons; bars, rods, angles and tees, 6560 tons; ingots, blooms and slabs 1166 tons; scrap, 2057 tons; galvanized and corrugated sheets 6334; galvanized but not corrugated, 1928; plain sheets, 3537 tons; iron and steel wire, 1440 tons. More tonnage was imported during May, 1922, than in May, 1921, but the total value was £296 less.

A new steel company has been registered under the name of Steel Products (Australia) Ltd., with a capital of £40,000.

Make Bulk of China Steel

Washington, Oct. 3.—The United States and Great Britain in 1921 supplied most of the iron and steel entering China through Hongkong, states American Consul General Gale at Hongkong. Of imports of rivets the United States provided 52 per cent and Britain 45; of plates the United States 53 per cent and Britain 45; of wire the United States 18 per cent and Great Britain 27; of angles and tees the United States 52 per cent and Britain 40; and of wrought iron and steel pipes and tubes the United States 8 per cent and Britain 79.

Sells Foundry Property

The Crompton & Knowles Loom Works, Worcester, Mass., has sold its Star Foundry Co., property in that city to Edward D. Priest, Schenectady, N. Y. The consideration was about $20,000. It consists of a one story and basement foundry and 46,253 feet of land, assessed for $22,800. The foundry has not been operated since the war when it was leased by the Standard Foundry Co. The property is to be developed for manufacturing.

Lorraine Ore Exports Gain

Washington, Oct. 3.—Exports of iron ore from the Lorraine mines in the first six months of 1922 totaled 4,328,453 metric tons, valued at 99,000,000 francs, Assistant Trade Commission Green at Paris has reported to the department of commerce. Exports in the first half of 1921 amounted to only 2,666,428 tons valued at 61,000,000 francs. Shipments of ore to Germany are reported to be increasing.

Sweden Exports More Ore

Washington, Oct. 3.—By the end of June exports of Swedish iron ore from the port of Narvik were 460,000 tons greater than in the first half of 1921, Consul Murphy, at Stockholm, has informed the department of commerce. Shipments from Lulea, another Swedish port, also have increased. Stocks of ore at the mines have diminished. German dumping of iron and steel is reported to be a disturbing factor. Prices at the Swedish mills are claimed to be below the cost of production.

Farrell Plant Again Wins Safety Trophy

The Farrell, Pa., works of the Carnegie Steel Co., of which A. L. Cromlish is general superintendent, has been awarded the bronze welfare trophy for having made the best safety record during August. There were no lost-time accidents at the Farrell works during the month, which was the best record made among all of the works of the Carnegie company. The record established is remarkable in view of the fact that extension work was carried on at the plant during August and this is considered hazardous. The Farrell works has won the trophy on four different occasions. When the trophy was placed in completion in 1921, the Farrell works won it for three consecutive months. The plant was not in competition from that time until May of this year because of a shut down. The Braddock works of the Carnegie company won the trophy in July and Farrell regained possession for August.

General Index Unchanged

Washington, Oct. 3.—The bureau of labor statistics' index number of wholesale prices for August is 155, identical with that for July and 13 points above that for August, 1921. The August index of metals and metal products is 126, compared with 121 for July and 117 for last August. Of the nine basic commodities covered, six show an increase for August, two reveal decreases and one is unchanged.

Cement Output Up Again

Washington, Oct. 3.—August production of Portland cement in the United States reached 11,664,000 barrels, compared with 11,557,000 barrels in July and 10,244,000 in August last year, the geological survey reports. Shipments in August totaled 14,361,000 barrels, against 13,850,000 in July and 12,340,000 in August, 1921. Stocks at the end of August amounted to 5,737,000 barrels, a sharp decrease from the 8,433,000 on hand at the end of July and 6,953,000 at the close of August, 1921.

Stockholders of the Penn Seaboard Steel Corp. at a special meeting on Sept. 9, approved the plan of the directors to increase the capital stock from 700,000 to 1,200,000 shares of no par value.

Great Britain's Exports Are Increasing

Birmingham, Eng., Sept. 25.—The British board of trade returns for August show a total export of iron and steel products including scrap of 281,954 tons as compared with 268,507 tons for July and 249,089 tons for June. The aggregate of the iron and steel exports for the first eight months of this year is 2,174,096 tons as against 1,025,312 in the corresponding period of 1921. Total iron and steel imports including scrap for August amounted to 84,003 tons as against 149,231 tons while the aggregate for the eight months of 1922 was 599,049 tons as compared with 1,105,393 tons for the corresponding period of 1921. The complete totals follow:

Exports

	Month ended August		Eight months ended August	
	1921	1922	1921	1922
Scrap	2,702	11,971	12,901	112,432
Pig iron:				
Forge and foundry	2,423	19,003	36,473	132,892
Acid	913	11,640	31,319	140,967
Basic	....	....	447	3,047
Ferroalloys	1,756	15,607	24,757	94,532
Steel ingots	....	52	131	319
Blooms, billets, slabs	42	364	695	4,693
Bars, rods, angles, shapes, etc.	5,300	20,235	83,534	143,436
Castings, iron	16	162	444	525
Castings, steel	32	91	259	349
Forgings, iron	....	10	67	101
Steel girders, beams, etc.	2,557	4,585	28,572	36,476
Hoops and strips	901	4,834	10,967	27,573
Plates and sheets, not galvanized:				
Armor plates	....	311	....	3,618
Plates and sheets, not under ⅛-inch thick	6,174	6,273	103,968	46,487
Plates and black sheets under ⅛-inch thick	1,093	13,855	27,118	105,302
Black plates	388	4,722	6,940	36,973
Galv. sheets	10,153	47,404	71,941	350,587
Tin plate	8,787	36,817	123,848	298,194
Cast tubes, pipes and fittings	2,313	8,093	40,457	42,282
Wrought tubes, pipes and fittings	3,186	8,395	55,097	48,199
Rails for trams	305	12	4,464	4,535
Railway rails	4,848	22,358	87,748	176,645
Sleepers and fish-plates	4,908	10,025	35,236	111,490
Tires and axles	1,004	997	16,777	7,949
Wheels and axles	1,175	1,598	19,252	17,389
Railway material, other types	1,746	2,781	23,524	27,032
Wire	1,110	5,893	14,577	30,405
Wire manufactures	2,364	3,817	14,758	19,390
Nails and tacks	546	1,042	5,694	7,658
Wood screws	191	182	1,584	1,821
Bolts and nuts	755	1,803	9,809	9,790
Manufactures of cast iron	1,097	1,146	12,849	9,013

Imports

	Month ended August		Eight months ended August	
	1921	1922	1921	1922
Pig iron:				
Forge and foundry	43,552	4,444	217,667	31,746
Acid	30	155	6,076	155
Basic	20,058	10,086	84,323	62,853
Ferroalloys	497	797	2,572	6,151
Steel ingots	70	267	5,700	2,732
Scrap	7,725	3,890	124,523	72,266
Blooms, billets, slabs:				
Iron	....	2,934	5,622	6,798
Steel	15,296	15,332	112,369	85,067
Bars, rods, angles, shapes, etc.:				
Iron	9,289	5,972	92,269	41,489
Steel	10,403	2,908	61,785	41,338
Wire rods	2,369	7,849	16,041	32,636
Other steel	6,316	3,368	61,574	24,187
Special steels	215	28	943	411
Castings, iron	473	102	8,010	2,186
Castings, steel	696	138	4,477	2,266
Forgings, iron	70	4	2,313	211
Forgings, steel	84	135	304	609
Steel girders, beams, etc.	3,843	5,473	25,201	20,735
Hoops and strips	1,623	2,911	19,030	16,647
Plates and sheets	7,843	1,616	102,443	22,168
Cast tubes, pipes and fittings	2,686	1,964	18,924	12,282
Wrought tubes, pipes and fittings	2,450	2,023	19,843	15,758
Rails for trams	....	155	20,477	2,714
Railway rails	2,031	1,560	15,278	9,841
Tires and axles	18	10	311	460
Railway material, other types	801	602	6,623	3,835
Wire	3,891	2,941	22,336	24,612
Wire nails, including staples	3,466	3,192	21,389	25,905
Wire manufactures, other sorts	357	329	1,862	3,423
Nails and tacks	337	171	3,378	2,269
Bolts and nuts	219	391	4,724	3,515
Manufactures of iron and steel, other sorts	1,512	1,122	10,121	12,136

Obituaries

WALTER CRAFTS WITHERBEE, chairmain of the board directors of Witherbee, Sherman & Co., iron ore and pig iron producers, died at his home in Port Henry, N. Y., Sept. 28, after a short illness. Mr. Witherbee was born in Port Henry, July 1, 1856, the son of Silas H. Witherbee, founder of Witherbee, Sherman & Co. Mr. Witherbee was educated in private schools of New York city and was graduated from Yale in 1880. He then became a member of the firm and after the incorporation of Witherbee, Sherman & Co. in 1900, became the treasurer of the company. This office he retained until the death of his cousin, F. S. Witherbee, who had been president of the company. Walter Crafts Witherbee then became chairman of the company. He also was vice president of the Port Henry Iron Ore Co. for many years. Mr. Witherbee was president of the Citizens National bank of Port Henry and president of the Port Henry board of trade. He was a republican and was influential in politics in northern New York, but the only office he ever held was as collector of the port of Champlain, to which President Roosevelt appointed him.

Leander F. Hutcherson, president of the Stafford Iron Works, Inc., Worcester, Mass., died in a Brookline, Mass., hospital, recently at the age of 57 years.

William G. Luitink, vice president of the Luitink & Sons Mfg. Co., Milwaukee, manufacturing patterns, hardware specialties, etc., was stricken with paralysis and died Sept. 24 at the age of 58 years.

Frank H. Parker, president of the Parker Motor Truck Co., Milwaukee, died at Columbia hospital Sept. 29 after an operation. He was 67 years old. Mr. Parker was head of the Mueller & Son Co., box manufacturers, and several other Milwaukee concerns.

Roswell G. Yingling, aged 69 years, president and director of the Yingling-Martin Brick Co., and secretary, treasurer and director of the Kittanning Brick & Fire Clay Co., Pittsburgh, died Sept. 27 at his home in Wilkinsburg, Pa.

Marcellus L. Bailey, for 34 years treasurer of the Union Mfg. Co., New Britain, Conn., with which he had been identified for 45 years last June, died at his home in that city, Sept. 26, aged 66 years. In 1884 Mr. Bailey was elected secretary of the company and three years later was made a director.

August Engel, one of the founders and vice president of the Milwaukee Brass Mfg. Co., 251 Lapham street, Milwaukee, since 1892, died Sept. 25 after an extended illness, aged 69 years. Prior to 1892 he was associated with the Hoffman & Billings Mfg. Co. of Milwaukee.

Wlady Konop, head of the Konop Iron Works, Astoria, L. I., died Sept. 24 in Lincoln hospital, New York, of injuries sustained in a subway station in New York. Mr. Konop, who was a leader in Polish affairs, dozed as he waited for a train and suddenly awakening, found a negro attempting to rob him. In the struggle which ensued, Mr. Konop fell and fractured his head on the concrete pavement.

Herbert C. Follinger, manager of the Chicago office of the Chain Belt Co., Milwaukee, died of pneumonia at his home in Chicago, Sept. 27. He had been ill only a few days. Mr. Follinger was 38 years old and was born at Fort Wayne, Ind. In 1902 he was graduated from the Chicago Manual Training school, now part of the University of Chicago, and entered the employ of the Otis Elevator Co. He became associated with the Chain Belt Co. in 1914 and in 1916 was appointed district manager for the Chicago territory.

The Reading Iron Co. announces that activity at its No. 1 puddle mill at Pottstown, idle for almost two years, will be resumed Oct 2.

Larger Orders

Placed in Refractory Market—Labor Shortage Becoming Acute

Pittsburgh, Oct. 3.—With the refractories market showing a rising tendency consumers are active as buyers. The latest advance was in connection with fire clay brick, prominent makers inaugurating an increase of $3 per thousand on Sept. 23. The present Pennsylvania fire clay brick price range is $43 to $46. For the past month or so many users have taken advantage of their lowered operating schedules to make repairs and while some buying ahead to the end of the year has been done, the majority of the orders have been for prompt needs. The Otis Steel Co. order was perhaps the largest placed since that of the Carnegie Steel Co. for Clairton by-product coke oven works. The Otis order is understood to involve approximately 3,000,000 fire clay and silica brick. The Weirton Steel Co. order for coke oven brick is larger than ordinary. Several orders for both fire clay and silica placed recently have involved 100,000 to 350,000 brick with an occasional one for 500,000. Frequent orders for 30,000 to 50,000 brick are noted. One or two complete blast furnace relinings have been ordered. The Pennsylvania silica brick price remains the same, namely $53. Most brick plants are operating on a 70 to 80 per cent basis. However, this level may be increased in many instances but for the labor shortage which in some directions is severe because men are leaving brick plants for the coal mines. Railroad embargoes, car shortages and other transportation difficulties also serve as deterrents. Chrome brick is quoted at $50 to $55 with some fair sized orders being booked although the majority of the orders now on the books were taken at lower figures, one interest alone booking something like an aggregate of 350,000 brick just before the advance to the $50 level. The usual order for chrome brick involves 25,000 and 50,000 brick although once in a while a larger one puts in its appearance. Magnesite brick is being ordered in lots of a carload or two at a time and some sales have been recorded on the new basis of $75, inaugurated since the levying of the tariff of $11.50 per ton on grain magnesite which now is quoted at $43.50. New inquiries before the trade for both chrome and magnesite brick only are fair.

Refractories

FIRE CLAY BRICK

(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$43.00 to 46.00
Pennsylvania, No. 2	38.00 to 43.00
Ohio, No. 1	41.00 to 43.00
Ohio, No. 2	39.00 to 41.00
Illinois, No. 1	43.00 to 46.00
Illinois, No. 2	40.00 to 42.00
Kentucky, No. 1	43.00 to 45.00
Kentucky, No. 2	39.00 to 41.00
Missouri, No. 1	35.00 to 40.00
Missouri, high grade	45.00 to 50.00
Maryland, No. 1	40.00 to 45.00
Maryland, No. 2	30.00 to 35.00

SILICA BRICK

Pennsylvania	$45.00
Chicago	53.00
Birmingham	48.00

MAGNESITE BRICK

(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$75.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	$50.00 to 55.00

Seeks Information on Fluorspar Industry

All phases of the fluorspar industry of the United States will be investigated, the federal bureau of mines states, because the importance of fluorspar in the steel and ceramic industries has become so great and accurate information on methods of mining, milling and utilization is lacking. With the co-operation of several fluorspar producers an examination already has been made of the principal deposits in western states. The bureau states that costs of production in the Illinois-Kentucky field have increased greatly because of the increasing depth of the mines, high labor and supplies and the large amount of water that must be pumped.

Conducts Research on Use of Dolomite

If the lime in dolomite can be combined so as to render it nonslaking and at the same time hold up the refractoriness of the material, the abundant deposits of dolomite in the country would be rendered available for extensive use as a basic refractory, according to the United States bureau of mines. Briquettes containing 90 per cent dolomite and varying percentages of iron oxide and clay have been burned by the bureau at the ceramic experiment station, Columbus, O. The slowest slaking mixture was selected for making into bricks which were burned to a high enough temperature to render the lime inactive. Bricks with a high fusion temperature and high specific gravity, great mechanical strength, and low porosity were the result. The work is being continued, using varying percentages of dolomite to determine the nonslaking areas over the entire field.

Price Advances

Shown on Sulphate of Ammonia—Other By-Products Nominal

New York, Oct. 3.—Production of coal tar by-products is increasing steadily, however, it is likely it will be several weeks before sellers are in the position to make promises as to nearby delivery. This is true particularly of the light oil distillates.

A further advance is noted in sulphate of ammonia. Material for domestic account now is being offered in limited quantities at around $3 to $3.05, works; for foreign, offerings are ranging around $3.65 to $3.70, port. Foreign demand, however, is small, attributable in part to the fact sizable quantities previously booked have only been released recently.

Other prices are unchanged as follows: Pure benzol and toluol, 30 to 33 cents; solvent naphtha, 27 to 29 cents, and commercial xylol, 29 to 32 cents. Naphthalene is purely nominal, the lack of new business making it difficult to establish a market.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30 to $0.33
Toluol	.30 to .33
Solvent naphtha	.27 to .29
Commercial xylol	.29 to .32

Per Pound at Producers' Plants

Phenol	$0.20 to $0.22½
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.00 to $3.05

Contract

Pure benzol	$0.30 to $0.33
Toluol	.30 to .33
Solvent naphtha	.27 to .29
Commercial xylol	.29 to .32

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia (12 months)	$3.00 to $3.05

Continues Investigation

Investigation of fire brick in malleable iron bungs has been continued, the federal bureau of mines states, in order to translate for the users of clay refractories laboratory results into malleable iron furnace practice. Different types of brick in actual use were found to withstand from 3 to 22 heats but the standard laboratory tests did not reveal such a spread. A thorough study is being made of the relation between laboratory and service tests to assist manufacturers in utilizing fire clays for malleable iron furnace brick.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

TIMOTHY BURNS, who has been appointed general manager of the Lackawanna plant of the Bethlehem Steel Co., has been general superintendent of the Saucon works at the Bethlehem, Pa., plant since Sept. 1, 1917. He entered Bethlehem's employ Jan. 1 that year at Sparrows Point and was engaged in general construction of furnaces and mills. Previously since 1912 he had been with the Pittsburgh Crucible Steel Co. as general superintendent. He superintended construction of the company's merchant mills and was active in the development of alloy steels. For four years before that connection, Mr. Burns was employed in the bar mills of the Carnegie Steel Co.'s Duquesne plant. From 1901 to 1908 he worked in the bar mills of the Cambria Steel Co. at Johnstown, Pa. He was born in Lawrence, Kans., Aug. 31, 1877, and was educated in preparatory school at Yankton college, South Dakota, and was graduated from Lehigh university in 1901 in mechanical engineering. His summers in college were spent in government surveys in Bad Lands, S. Dak.

Franc H. Burnett, who has been made assistant to Mr. Burns, was born in El Paso, Ill., and was educated in the Joliet grade and high schools. He went to work for the Illinois Steel Co.'s Joliet works in 1895 as a messenger boy. He worked in the bessemer plant and as storekeeper. He went to the Lackawanna Steel Co. as assistant general purchasing agent. In 1910 he became general purchasing agent and held that position till his recent promotion.

C. B. Minnes, who was assistant to Mr. Burnett, is now assistant to the purchasing agent, Bethlehem Steel Co. Before his Lackawanna connection he was with the Gould Coupler Co., Depew, N. Y.

Herbert F. Miller Jr., who has been assistant superintendent of the Lackawanna company, has been made superintendent of the open-hearth and bessemer departments of the Lackawanna plant. Mr. Miller formerly was assistant superintendent of the open-hearth department of the Bethlehem works at Sparrows Point, Md. Between the two connections, he was superintendent of the Hewitt Steel Co., Newark, N. J. His earlier associations had been with the Carnegie Steel Co., the Verona Steel Castings Co., Verona, Pa., and the Sweets Steel Co., Williamsport, Pa.

Harry J. Kelley, assistant general superintendent of the Lackawanna Steel Co., has been retained as superintendent of mills in Bethlehem's Lackawanna plant. Previously he had been superintendent of the rail mills

TIMOTHY BURNS

and before that assistant master mechanic. Mr. Kelley started as an apprentice in the mechanical department of the Lackawanna company's Scranton, Pa., plant.

A. E. Quere, formerly with the Niles Steel Products Co., Niles, O., has been appointed assistant general manager of sales of the Ashtabula Steel Co., Ashtabula, O.

John H. Trumbull, president of the Trumbull Electric Mfg. Co., Plainville, Conn., has been renominated by the Republicans as state senator for his district.

M. F. King, formerly of the Kings Refractories Co., has joined the sales and service department of the Quigley Furnace Specialties Co., New York. Mr. King will devote his attention to service and sales work in New York City.

Edwin C. Welch, for the past three years in charge of tubular products sales for the Consolidated Steel Corp., has resigned from that company to become the eastern representative of the Kelmet Metals Co., Inc., Cleveland. Mr. Welch will be located in New York.

Charles L. Saunders has been placed in charge of offices opened at 619 Brown-Marks building, Birmingham, Ala., by the Brown Instrument Co., and George Goodman has been named to manager the office established at 185 Devonshire street, Boston.

John F. Miller, vice chairman of the board of directors of the Westinghouse Airbrake Co., Wilmerding, Pa., has been elected a member of the board of trustees of the College of Wooster, Wooster, O. Mr. Miller was graduated from the college in 1881. He resigned as president of the Westinghouse company several years ago.

A. L. Lee, of the engineering department of the American Bridge Co., Pittsburgh, with which he has been associated 25 years, sailed from New York Sept. 27, to become residential engineer of the United States Steel Products Co.'s plants at Bombay and Calcutta, India. He was the guest of honor at a banquet Sept. 22 given by 125 representatives of all departments of the Ambridge, Pa., plant.

J. W. Floto, for four years district sales manager at Detroit for the Globe Steel Tubes Co., has been made general manager of sales for this company with offices in the Peoples Gas building, Chicago. F. J. O'Brien, vice president and general manager is moving his office to Milwaukee, where the mills are situated.

John Aurelius has resigned as superintendent of the Farrell, Pa., plant of the American Steel & Wire Co. Mr. Aurelius has been in the service of the company for 35 years and went to Farrell from the Newburg plant at Cleveland. Mr. Aurelius will return to Cleveland and engage in the real estate business.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

GEORGE W. WHITEHEAD, assistant general manager of the Lackawanna plant of the Bethlehem Steel Co., was born in Port Henry, N. Y., in 1879 and was educated at Port Henry and Boston, Mass. He went to the Illinois Steel Co. in 1900 and remained there until E. A. S. Clarke, Charles H. McCullough, Jr., and others went to Lackawanna. He was in the bessemer department there in various capacities. He became night superintendent, and later, metallurgist,

GEORGE W. WHITEHEAD

superintendent of the bessemer, assistant plant superintendent, assistant general superintendent, and general superintendent of Lackawanna Steel Co., which position he held prior to his promotion Sept. 19.

Keith R. Rodney has been appointed works manager of the Chrome Steel Works, Chrome, N. J.

T. C. Craig, assistant manager of the Forsyth Bros. Co., Harvey, Ill., manufacturer of pressed steel products, resigned effective Oct. 1.

Jonas Northrop, president of the Hopedale Mfg. Co., Milford, Mass., has returned from a six weeks' trip to Europe.

James A. Buell, assistant general manager of the United Alloy Steel Corp., Canton, O., has resigned to become general superintendent of the Donner Steel Co., Buffalo.

C. J. McNamara, general manager of the Inland Malleable Iron & Steel Co., Terre Haute, Ind., has taken complete charge of sales for the organization.

John F. Price, formerly comptroller of the Brown Hoisting Machinery Co., Cleveland, has been appointed vice president of the George T. Trundle Jr. Engineering Co., 118 St. Clair avenue, Cleveland.

L. O. Helgesen, who has been in charge of the northwestern business of the Paul J. Kalman Co., Chicago, concrete bars, with his headquarters in Minneapolis, has been appointed New York manager for the company which has bought the business of the Fougner Concrete Steel Co., 29 Broadway, New York.

Frank L. Atwood, who has been vice president of the Midwest Engine Co. at Anderson, Ind., became general manager of the Hill Pump Co., Anderson, Oct. 1. The sales and mechanical departments of the Hill company are to be moved from Indianapolis to Anderson.

H. G. Austin, formerly assistant to H. L. Stevens, general manager of sales of the Central Iron & Steel Co., Harrisburg, Pa., when Mr. Stevens was district manager for the Lackawanna Steel Co., at Boston, has been appointed New England district manager of sales for the Central Iron & Steel Co., with offices in the Board of Trade building, Boston.

Frederico Giolitti, metallurgist and head of the Ansaldo Works, Turin, Italy, was the guest of honor at a dinner given recently by the iron and steel committee of the American Institute of Mining and Metallurgical Engineering in the club rooms of the Federated American Engineers' society, 120 Broadway, New York.

Mark C. Smith, formerly with the Cleveland branch of the Westinghouse Electric & Mfg. Co., has been appointed district sales manager of the motor department of the Ohio Electric & Controller Co., Cleveland, with his headquarters at 53 West Jackson boulevard, Chicago. The Ohio company also has appointed A. J. Reed, until recently general sales manager of the Robbins & Myers Co., Springfield, as district sales representative of the motor department with an office at 221 North Eleventh street, Philadelphia.

R. C. Kirk has been elected a director, a vice president and treasurer of the Follansbee Bros. Co., Follansbee, W. Va. Mr. Kirk has had a wide and extensive connection with the steel industry, having entered the

R. C. KIRK

employ of the Falcon Sheet & Tin Plate Co., Niles, O., in 1895, where he remained until its absorption by the American Sheet Steel Co. and the American Tin Plate Co., in 1899-1900. In the latter year, he entered the accounting department of the American Sheet Steel Co., New York, and remained until 1903 when he became auditor for La Belle Iron Works, Steubenville, O. One year later he was elected treasurer of that company and in 1903 was made secretary-treasurer. In 1915 he was elected president, fulfilling the duties of that office until 1920, when the Wheeling Steel Corp. was formed to take in the La Belle company, the Wheeling Steel & Iron Co., and the Whitaker-Glessner Co.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

NOTICE of its intentions to incorporate under the name of the Sharon Pressed Steel Corp., Sharon, Pa., has been filed by the company. The applicants for the new charter are officers of the Sharon Pressed Steel Co. The formation of the corporation is the final step in the reorganization and refinancing of the present company. President H. W. Torney states that business rapidly is recovering and many orders are on the books. These, with business in sight, will keep the plant, which is located at Wheatland, running steadily at practically 100 per cent for the next several months. The Sharon Pressed Steel Co., together with the Mercer works of the American Sheet & Tin Plate Co., were two plants in the Shenango valley that were able to keep running six days a week during the business depression.

* * *

CONTRACT has been taken by the International Combustion Engineering Corp., New York, for the installation of stokers for the Carnegie Steel Co.'s by-product coke plant at Clairton, Pa.

* * *

TATE-JONES & Co., Inc., Pittsburgh, furnace engineers, have taken a contract from the Weirton Steel Co., Weirton, W. Va., for continuous pair furnaces, sheet furnaces and box annealing furnaces for the new 8-mill sheet plant being built at Weirton.

* * *

CARL MERRIMAN, again has been taken over by the Akron Scrap Iron Co., Akron, O. Mr. Merriman sold out his interest in the company two years ago to a corporation. The Akron Scrap Iron Co. employs about 30 men and does an annual business of about $1,000,000.

* * *

FIFTY stockholders of the Kokomo Malleable Iron Co., Kokomo, Ind., recently voted in favor of the proposed purchase of the company by a group of manufacturers, including interests owning the Kokomo Brass Works. The transfer can not be effected until the remainder of the stockholders have voted. Under the proposed agreement the new owners will take over the business of the company, assuming all liabilities and will issue preferred stock in the reorganized company for all common and preferred stock of the malleable company. For the present the malleable company will be operated as a separate company, but it is expected later it will be merged with the group of industries in which J. W. Johnson, John P. Grace, C. F. Byrne, and George Kingsten, the latter two owners of the Kokomo Brass Works, are interested.

* * *

THE Rockwood Mfg. Co., Indianapolis, is to remodel its foundry into a machine shop and will build a 1-story extension to the present building, according to George O. Rockwood, president. The contract has been let and work is expected to begin shortly. The building, when added to and remodeled will be of brick and heavy mill construction, with wood block floors, steel sash, a gravel roof and a traveling crane.

* * *

DECISION of the General Motors Corp., Detroit, to discontinue the manufacture of tractors and farm implements, means liquidation of the Samson Tractor Co., Janesville, Wis. The Samson plant is to be turned over to the Chevrolet Motors division, beginning at once and progressing as the tractor and implement business is wound up. It is reported part of the Janesville plant will be used for the production of an air-cooled motor vehicle which General Motors Corp. is said to be developing. More than $5,000,000 has been spent in erecting the Janesville plant, which has one of the largest foundries in the Middle West and large machine shops and assembling rooms.

* * *

PLANT and equipment of the Jones Gear Co., Wayside road and the Nickel Plate railroad, Cleveland, have been purchased by the L-M Axle Co., according to J. L. Vaughan, attorney and secretary of the company. The plant comprises four buildings on a tract of 10½ acres. The main building is 100 x 300 feet with a 2-story office addition. Two buildings each 40 x 40 feet, are used for heat treating and the fourth, 30 x 150 feet, is used for boiler house and storage. Immediate production is to be started of an automobile axle invented by Leo Melanowski, formerly an engineer with the White Motor Co. Officers of the L-M company are: President and treasurer, George B. Durell, who is treasurer of the American Fork & Hoe Co.; chairman, Warren H. Cowdery, president of the Fork & Hoe company; and secretary, Mr. Vaughan.

* * *

SO MUCH improvement has been experienced by the Allis-Chalmers Mfg. Co., Milwaukee, in the marketing of its tractors that steps have been taken to make a large increase in output by utilizing all of its tractor plants. Not all of this unit has been required up to this time and unused capacity was given over to the overflow from other shops of the company. At the close of the year these will go into a new shop building, 175 x 400 feet, now under construction. The new building will take in the flour mill and sawmill machinery departments, which will be moved from Milwaukee to West Allis, with the disposition of the old Reliance Works on Clinton street to other interests. This will consolidate all work at the main plant in West Allis.

* * *

ESTABLISHMENT of a large trunk manufacturing enterprise at Racine, Wis., is being undertaken by the Wheary-Burge Trunk Co., which was granted a charter recently under the laws of Wisconsin. The authorized capitalization is $500,000. George W. Wheary, until recently vice president and general manager of the Hartmann Trunk Co., Racine, and Harry L. Burge, western sales manager of the same company, are behind the new one. Three floors have been leased in the Racine industrial community buildings at Racine Junction and are being equipped with new machinery to manufacture wardrobe trunks and similar goods. Mr. Wheary was connected with the Hartmann company nearly 20 years. The new company expects to manufacture all materials and parts, including metal specialties, hardware, etc.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

ORGANIZATION of the Columbian Hardware Co., to take over the Columbian branch of the Consolidated Iron-Steel Mfg. Co., has been effected with the election of H. F. Seymour as president, E. Watkins as vice president, A. V. Cannon as secretary and H. M. Hitch treasurer. The Columbian branch formerly was the Columbian Hardware Co. before its merger with the Consolidated company. The old company was organized in 1880. The new company will continue to manufacture anvils, vises and drop forgings. It has a plant at East Fifty-third street and Hamilton avenue, Cleveland, which was bought from the Consolidated company.

* * *

WORK on the 1000-foot viaduct to facilitate the stocking, charging and handling of raw materials in the open-hearth department of the Farrell, Pa., works of the Carnegie Steel Co. will soon be completed according to a recent announcement. The improvement represents the outlay of several hundred thousand dollars and will result in increased efficiency and considerable labor saving.

* * *

THE Commercial Shearing & Stamping Co., Youngstown, O., has been reorganized recently following transfer of the Carnick interests in the company. Purchase of $30,000 worth of additional machinery has been authorized and the capacity of the plant, which of late has operated near capacity, will be increased. The following were elected officers and directors: President, W. A. Beecher; vice president, G. F. Alderdice; treasurer, Nathan Folsom; secretary, Guy Ohl and directors, C. B. Cushwa and George Donaldson.

* * *

AT THE annual election of the Pacific Car & Foundry Co., John Twohy, of Spokane, was re-elected president. Other officers named were: O. D. Colvin, vice president; H. N. Curd, vice president and general manager and W. S. Bassage, secretary. The board of directors includes William Pigott, John Twohy, T. S. Clingan, O. D. Colvin, James F. Twohy, H. N. Curd, F. W. Chriswell, Judge E. M. Wilson and D. E. McLoughlin, the latter two being interested in San Francisco headquarters of the Pacific Coast Steel Co. The Pacific Car & Foundry Co. operates a car building plant at Renton, near Seattle.

* * *

RESIGNING after a connection of more than 20 years with the sales department, Philadelphia district, of the Carnegie Steel Co., W. Newton Jeffress, has established a sales office in the International Building 1319 F. St. N. W. Washington, as direct sales representative of the the Boss Nut Co., Chicago; the Pittsburgh Knife & Forge Co., Pittsburgh; the Standard Seamless Tube Co., Pittsburgh; the Union Draft Gear Co., Chicago; the Universal Draft Gear Attachment Co., Chicago; and the Verona Tool Works, Pittsburgh. Mr. Jeffress has a wide acquaintance in eastern railroad circles, particularly in the Baltimore, Washington and southeastern districts.

* * *

COMPLETING about five years of experimental and development work, the Elwood Tractor Co., Madison, Wis., has succeeded in obtaining immediate facilities for commercial production of its tractor by effecting a merger with the Paris Engineering & Mfg. Co., Paris, Ill. The Elwood factory is being moved to Paris and plans are being made to build 1000 tractors in 1923, which will probably require some enlargement of the Paris shop and the installation of some additional tools. H. A. Burd, general manager, and C. D. Elwood, chief engineer of the Elwood company, will take entire charge of the consolidated plants at Paris.

* * *

CONSOLIDATING the Electric Repair & Engineering Co. of Cleveland, the Goodman Engineering Co. of Zanesville, O., and the Goodman-Krohngold Co. of Cleveland, the Industrial Electric Co. has been organized with office and warehouse at 5226-5232 St. Clair avenue, Cleveland. The company, engaged in power equipment engineering, machinery and iron products, is headed by I. E. Goodman and E. Levison. Mr. Goodman has had more than 20 years experience in the trade. Mr. Levison, who will be chief engineer and general manager, formerly was head of the Electric Repair & Engineering Co. and chief engineer of the Bissinger Co. He has had over 27 years experience as a consulting and designing electrical engineer.

* * *

REORGANIZATION of the Cronk & Carrier Mfg. Co., Elmira, N. Y., manufacturer of hardware specialties, has followed retirement of C. F. Carrier from the company and the sale of his interests to Fayette Nims. Mr. Carrier was one of the founders of the company in 1883. Retiring with Mr. Carrier is G. H. Carrier. Mr. Nims, who has been identified with the hardware trade for 15 years as a salesman, has been elected president and treasurer of the company and will have charge of sales. Elmer L. Cronk, who has had charge of production since retirement of his father, William Cronk, several years ago, is vice president and superintendent and W. J. Wetmore is secretary and assistant treasurer. The name of the company will not be changed.

* * *

SMALL commercial buildings, warehouses, garages, homes and interior partitions for office and factory buildings are being manufactured by the Stuko-Steel Cleveland Co., a new manufacturer which has equipped a plant at Harvard avenue and East 104th street, on the Wheeling & Lake Erie railroad, Cleveland. It has a capacity of five to 12 buildings daily, according to announcement by J. R. Mills, Cleveland sales manager of the Carnegie Steel Co. and chairman of the Cleveland Chamber of Commerce's committee on industrial development. The company's product is a system of construction embodying steel channels and metal lath so fabricated that the framework may be erected in a few hours. George P. Aldrige is general manager and H. J. Mader superintendent. Cleveland men interested in the company are J. E. Smith, Robert F. Berwald, J. G. Bingham and Fielder Sanders.

Cost of Living Declines Slightly in August

Despite the rise of fuel prices as a result of the strike, the cost of living among wage earners families in the United States on Aug. 15, 1922 declined .07 per cent compared with the previous month. According to the figures compiled by the National Industrial Conference board living costs are 54.5 per cent higher than in July 1914. The changes in the budget within the month were decreases in both clothing and food prices and a considerable increase in fuel prices. Between July 1920, when the peak in the rise of the cost of living was reached, and August 1922, the cost of living dropped 50 points or 24.4 per cent. The latest index marks the lowest point touched by the cost of living since the armistice. It is in keeping with the usual movement of prices that the cost of living, representing retail prices, should continue to fall while wholesale prices rise. Raw material and wholesale prices always are subject to greater and more violent fluctuations that retail prices are, and they usually turn upward or downward sometime before the cost of living changes its trend. The accompanying table shows the changes in the cost of living over a series of months.

Living Costs Compared

(Percentage over July, 1914)

July, 1914 to	All items	Food	Shelter	Clothing	Fuel and light	Sundries
Jan., 1920	90.2	97	43	170	49	77
Feb., 1920	93.5	101	45	177	49	78
Mar., 1920	94.8	100	49	177	49	83
Apr., 1920	96.6	100	50	188	51	83
May, 1920	101.6	111	51	187	55	83
June, 1920	103.0	115	51	176	61	85
July, 1920	104.5	119	58	166	66	85
Aug., 1920	103.2	119	58	155	69	85
Sept., 1920	99.4	107	59	155	78	88
Oct., 1920	97.3	103	59	148	83	90
Nov., 1920	93.1	93	66	128	100	92
Dec., 1920	90.0	93	66	105	100	92
Jan., 1921	81.2	78	66	87	100	92
Feb., 1921	76.3	72	66	74	98	90
Mar., 1921	68.7	56	71	74	87	85
Apr., 1921	67.6	56	71	69	79	85
May, 1921	65.7	52	71	68	78	85
June, 1921	61.9	45	71	62	78	85
July, 1921	63.1	48	69	64	79	85
Aug., 1921	62.0	48	69	59	79	83
Sept., 1921	64.8	55	69	57	79	83
Oct., 1921	63.7	53	69	60	79	80
Nov., 1921	63.0	[illegible]	69	61	79	78
Dec., 1921	62.7	52	69	57	79	78
Jan., 1922	61.4	50	69	56	78	78
Feb., 1922	57.7	42	69	56	77	77
Mar., 1922	54.7	39	65	56	74	74
Apr., 1922	54.8	39	65	55	74	74
May, 1922	54.9	39	65	56	74	74
June, 1922	55.4	41	65	53	74	74
July, 1922	55.6	42	65	54	74	74
Aug., 1922	54.5	39	65	53	81	72

Declare Open Shop for 45 Cleveland Plants

An open shop declaration was added to the constitution of the East End Manufactuers association, Cleveland, at a recent meeting at the Country club. The organization is composed of 45 manufacturing companies located in the eastern section of the city. The open shop amendment read in part as follows:

"This association indorses the open shop plan of employment, it being understood the said plan of employment provides for the right of an employe to work and to bargain for his labor and of an employer to hire and employ labor at such terms and conditions as may be mutually acceptable to the two parties directly concerned without interference, coercion, intimidation or unpleasant attention from any source whatever, and for the selection, retention and advancement of employes, on the basis of their individual merit and without regard to their affiliation or nonaffiliation with any organization and forbids any contract, agreement, rule or understanding requiring membership or nonmembership in any oganization as a necessary condition of employment.

"The officers and directors of this association shall from time to time take such steps as they may deem necessary to bring about the establishment and perpetuation of the open shop plan of employment in this community."

Officers were elected at the meeting as follows: President, W. R. Mitchell, National Acme Mfg. Co.; vice president, L. E. Connelly, D. Connelly Boiler Co.; secretary, G. F. White, Elyria Iron and Steel Co.; treasurer, C. C. Robbins, Cleveland Crane & Engineering Co.; committeemen, Glenn L. Martin, Glenn L. Martin Co., P. W. Day, International Steel Tie Co., C. G. Frantz, Apex Electric Mfg. Co.

August Steel Wages Gain with Fewer Employed

Washington, Oct. 3.—Payrolls in the iron and steel industry in August advanced 13.8 per cent over July while the number of workmen actually decreased 1.1 per cent, the August survey of the bureau of labor statistics, department of labor, reveals. In every branch of the metal industry wages went up in August, in every case far more than the increase in personnel and in some cases, as in the iron and steel industry proper, in spite of reduced personnel.

Comparing August this year with August last year a large gain for this year is evident. One hundred and twelve typical iron and steel plants that employed 103,458 men last August were employing 141,435 men this August—a gain of 36.7 per cent. These same plants had payrolls totaling $4,348,589 last August and $6,848,589 this August, an increase of 57.5 per cent. The comparison for August and July of this year is given in the accompanying table.

The car building and repairing industry led in August in increases of per capita earnings, this probably being due to higher wages paid to new men to replace strikers. Car building and repairing workmen in August averaged 32.4 per cent more pay than in July. The per capita gain in August over July in the iron and steel works was 15.1 per cent, in the automobile industry 8.6, in agricultural implement works 5.3 per cent, in hardware plants 3.2, in foundry and machine shops 2.9, and in steel shipbuilding plants 1.4.

The September report of the bureau will show an even greater increase in iron and steel works wages, it is believed.

	Number of establishments	Number on payroll in August	Number on payroll in July	Amount of payroll in August	Amount of payroll in July
*Iron and steel	125	153,260	155,030	$7,424,212	$6,523,949
*Car building and repairing	72	49,732	52,319	2,685,339	2,134,427
Automobile	97	152,827	152,147	4,931,748	4,519,643
Foundry and machine shops	154	68,094	67,614	1,794,885	1,731,647
Hardware	16	15,016	14,637	312,013	294,749
Agricultural implements	39	14,646	14,392	359,485	335,283
Shipbuilding (steel)	15	12,088	10,985	326,429	292,602

*For half-month period; all others one week.

Molders' Wages Higher

Increases have been made in molders' wages in several cities effective Oct. 1. The Pittsburgh rate now is $6.44 instead of $5.60, that of Boston $6 which formerly was $5.60 and Cleveland, $6 as against $5 before. The 8-hour basis is used in each city. The complete rates follow:

Minneapolis	$6.00
Pittsburgh	6.44
Indianapolis	5.60
Detroit	6.00
New Orleans	6.00
St. Louis	6.00
Boston	6.00
Cincinnati	5.50
New York	6.25
Cleveland	6.00
Chicago	6.50

Enjoins Unions Tactics

The supreme court of Massachusetts on Sept. 22 issued a final decree in the case of the Moore Drop Forging Co., against the officers and members of the Central Labor union, all of Springfield, Mass. The order permanently enjoins the defendants from interfering or attempting to interfere with the business of the plaintiff, from preventing or seeking to prevent the plaintiff from entering into individual contracts with its employes, from persuading any person from patronizing the plaintiff or using or dealing in the plaintiff's products, and from parading at or near the plaintiff's plant with signs, wagons or trucks for the purpose of interfering with or annoying or disturbing the plaintiff's employes. The defendants have appealed to the full court.

Railroad Tool Buying Features

Demand for Equipment in September Was Not Up to Expectations Despite Large Purchases by the Railroads—Prospective Business Continues Large, Numerous Lists Becoming Current—Prices Tending to Higher Levels

HEAVIER buying by the railroads featured the machine tool and equipment market during September. With the settlement of the rail strike during the early part of the month, practically all the major roads in the country entered the market either by making purchases or issuing inquiries, and it is confidently expected that those roads which have postponed purchases will place orders before many weeks. Aside from the heavier railroad buying, however, the market was devoid of feature. Expected large industrial buying did not materialize despite the fact operations have steadily increased since the settlement of the rail strike and the assurance of better coal shipments. This apparent reluctance on the part of machinery users is puzzling to dealers and manufacturers in view of the tendency of machine tool prices to rise.

Large Prospective Railroad Demand

THE volume of business done with the various railroads during the month was extremely large, one interest alone making an equipment investment of at least $500,000. Included in railroad buyers were the Illinois Central, the Union Pacific, the Delaware & Hudson, the Santa Fe, the Rock Island, the Lima Locomotive Works, the Long Island, the New York Central, the Boston & Albany, the Oregon & Washington Railroad & Navigation Co., the Los Angeles & Salt Lake City railroad, the Atchison, Topeka & Santa Fe and the Pittsburgh & Lake Erie. Prospective railroad demand is enormous and inquiries have either been placed in the market or are expected from the Chicago, Burlington & Quincy; Chicago, Rock Island & Pacific; Central of Georgia; Chicago, Milwaukee & St. Paul; Baldwin Locomotive Works; Pennsylvania; Lima Locomotive Works; Canadian National; Missouri, Kansas & Texas; Canadian Pacific; Boston & Maine; New York Central; Munising, Marquette & Southeastern; Lake Superior, Ishpeming, Minneapolis, St. Paul & Sault Ste Marie; Richmond, Fredericksburg & Potomac; Southern Pacific and the Union Pacific railroads.

Some Fair Industrial Buying

WHILE it is true general industrial buying of machine tools did not come up to expectations, nevertheless, considerable buying by these interests was done. Buyers of size included the Spicer Mfg. Co., Plainfield, N. J.; Continental Motors Co., Muskegon, Mich.; Studebaker Corp., South Bend, Ind.; International Harvester Co., Chicago; Universal Portland Cement Co., Buffington, Ind.; General Electric Co., Lynn, Mass.; Ternsted Mfg. Co., Detroit and the American-La France Co., Elmira, N. Y. Inquiry from general industrial equipment users was fair and future buying of size is expected by the Nash Motor Co., Milwaukee; Stephen & Wolff, Inc., Rockford, Ill.; Dodge Bros., Detroit; Pickands, Mather & Co., Cleveland; H. H. Frankling Mfg. Co., Syracuse, N. Y.; Otis Steel Co., Cleveland; the Magma Copper Co., Superior, Ariz.; the Central Foundry & Machine Co., Warwood, W. Va.; Parker Axles, Inc., Poughkeepsie, N. Y.; Canadian Johns Manville Co., Toronto, Ont., and the Globe Malleable Iron Co., Syracuse, N. Y. Included in prospective business also are a number of fairly large inquiries from numerous school boards including the Pittsburgh, Beaver Falls, Pa., Monaca, Pa., Clark's Summit, Pa., and Pittsburgh, Cal., boards.

Single Tool Inquiries Numerous

IN ADDITION to the large inquiries in the market probably the greatest pending business is represented in the number of single tool units inquired for. Dealers in all parts of the country report they have been almost flooded with single tool requests and while action on many of them has been postponed time after time by far the majoriry have resulted in early buying, indicating prompt need on the part of the buyer. However, this business has been mostly in secondhand equipment, in fact, very little of it being diverted to new tools. As a result of the fact buyers for the past two years have shown a preference for used equipment in making purchases, this class of machinery fast is being liquidated and consequently used machinery dealers are hard pushed to furnish customers with tools of desired quality.

Equipment Prices Continue To Climb

MACHINE tool prices continue to climb to higher levels. With higher material and production costs tool builders find they are unable to turn out tools at the old levels and consequently are adjusting quotations to meet the present production costs. However, this action is not resulting in any great influx of orders. Some of the companies to adjust prices during September were the King Machine Tool Co., Cincinnati; the Ohio Machine Tool Co.; the South Bend Lathe Works, South Bend, Ind.; the Cincinnati Milling Machine Co., Cincinnati; the Cincinnati Shaper Co., Cincinnati; the Universal Boring Machine Co., Hudson, Mass.; the Rockford Milling Machine Co., Rockford, Ill.; the Foster Machine Co., Elkhart, Ind.; the National Acme Co., Cleveland; the American Tool Works, Cincinnati, and the Millholland Machine Co., Indianapolis.

Demand For Heavy Equipment

CRANE and heavy mill equipment demand during the month was active. Electrical equipment has been in spirited demand and with the development of water-power projects considerable of this class of equipment has been ordered. While actual demand for cranes was nothing extraordinary, a number of crane builders report their total orders were far in excess of anything they had done for some time. Tabulated crane awards for September as shown in THE IRON TRADE REVIEW totaled 112 which compares with 137 in August. Pending business in cranes during the month total 93 which is an increase as compared with 30 in August. This pending business includes several large projects including approximately 41 cranes for the proposed tube mill at Gary, Ind. Increasing costs of steel and higher wages are causing gradual advances in crane costs. It is estimated that the cost of locomotive cranes averages about one-half labor and one-half material. The cost of electric cranes varies according to type. As a result of these higher costs the tendency of builders is to quote higher.

Machinery Order Volume Fair

Demand for Shop Equipment Continues To Improve—Some Railroad Purchases Made and More Are Expected—Inquiry Rate Is Enormous—Prices Continue To Rise—Large Business in Cranes Pending

MACHINE tool and shop equipment demand continues to show steady improvement. While few outstanding orders have been placed the volume of business is large enough to keep dealers and manufacturers fairly busy. No complaints are heard from tool builders regarding their inability to continue shop operations due to a lack of business. As a result of the influx of orders, equipment prices are rising to higher levels. Higher production costs also have contributed to the latter. Several manufacturers during the past week announced price advances, including the Cincinnati Planer Co., Cincinnati.

Orders from the railroads appear to furnish the bulk of business in the East. During the past week buying was indulged in by the Central of Georgia, the Illinois Central, the Delaware & Hudson, the New York Central and several other railroads. However, most of this buying was of a small character. Other buyers included the Union Tank Car Co. and the General Electric Co.

The inquiry rate continues strong. Probably the most outstanding pending business is that from the railroads. Lists of size from these interests on which early action is expected include the Burlington and the Missouri, Kansas & Texas. General industrial inquiry is heavy but single tools comprise the bulk of individual inquiries.

Interest in cranes continues to grow although during the past week a slight letup in orders is reported. Inquiries continue to come out at a pleasing rate, however, and manufacturers are confident of a good demand the balance of the year. Pending business in cranes and hoists is large and include a number of steel mill projects.

Equipment Market Featured by Rail Purchases

NEW YORK, Oct. 3.—Distribution of orders for 10 machines by the Central of Georgia railroad features the eastern equipment market. Included in the list were heavy lathes and shapers. The Illinois Central, which recently brought out an additional list of about $50,000 of equipment, has also been a buyer, one buider in this district reporting orders for three machines. The Delaware & Hudson has closed on a 48-inch double-end wheel press, and the Union Tank Car Co. a 48-inch car wheel borer and double axle lathe, both orders going to the Niles-Bement-Pond Co., offices in this city.

The General Electric Co., has closed on several millers and lathes and is understood to be still negotiating on a list of eight small lathes, grinders and shapers, just recently inquired for. These latter are said to be for installation at Schenectady, N. Y., and Pittsfield, Mass. The street cleaning department, Seventeenth street and Avenue C, has awarded a formal order for three 12 x 4-inch lathes to the Reed-Prentice Co., Worcester, Mass.

Crane Awards and Inquiries of the Week

Orders Placed

One 10-ton hand-power crane for the Missouri, Kansas & Texas railroad, to the Whiting Corp.

One 15-ton hand-power crane for the Sessions Engineering Co., Chicago, to the Whiting Corp.

One three cubic yard bucket crane for Lehigh Portland Cement Co., Allentown, Pa., to the Whiting Corp.

One 20-ton locomotive crane for the Thilmany Pulp & Paper Co., Kaukauna, Wis., to the Browning Co.

One 20-ton steam shovel for David R. Roland, Terre Haute, Ind., to the Browning Co.

One coal handling gantry crane with 1½ yard bucket, for Chicago & Northwestern railroad, South Chicago, to the Milwaukee Electric Crane & Mfg. Co.

One 5-ton electric crane for the Abrasive Co. of Canada, Hamilton, Ont., to the Whiting Corp.

One 10-ton Shaw crane to an Ohio locomotive works through the Pittsburgh office of Manning, Maxwell & Moore, Inc.

Six cranes for the Youngstown Steel Co., to the Morgan Engineering Co., Alliance, O.

Six 2-ton hoists to the C. & G. Cooper Co., Mt. Vernon, O., to the Shepard Electric Crane & Hoist Co.

One 2-ton hoist for the American Steel & Wire Co., Cleveland, and one 5-ton hoist for the American Steel & Wire Co., Rankin, Pa., to the Shepard Electric Crane & Hoist Co.

One 5-ton 2-motor hoist for the Whitaker-Glessner Co., Wheeling, W. Va., to the Shepard Electric Crane & Hoist Co.

One 2-ton hoist for the Morrow Mfg. Co., Wellston, O., to the Shepard Electric Crane & Hoist Co.

One 5-ton 3-motor electric traveling crane with 43-foot span for the Cambridge Cement Stone Co., Boston, to the Northern Engineering Works, Detroit.

One 3-ton electric traveling crane with 52-foot span for Proctor & Schwartz, Philadelphia, to the Northern Engineering Works, Detroit.

One 5-ton crane with 28-foot span for Hillis & Sons, Ltd., Toronto, Ont., to the Northern Engineering Works, Detroit.

One used 30-ton locomotive crane, 50-foot boom, for Phoenix Utilities Co., 61 Broadway, New York, to Philip T. King, 30 Church street.

Conveyor system, 2000 feet, for Manning Paper Co., Troy, N. Y., to the Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O.

Two 3-ton, cab-controlled monorail hoists for shipment to Havana, to Euclid Crane & Hoist Co., Euclid, O.

Conveyor system, 1000 feet, for National Foundry Co., Brooklyn, to Tramrail division of Cleveland Crane & Engineering Co., Wickliffe, O.

One used 10-ton electric crane, 37-foot span, for the Concrete Steel Co., Cincinnati, to Industrial Equipment Co., 149 Broadway, New York.

One 7-ton crawler crane for City Coal Co., Hartford, Conn., to Orten & Steinbrenner Co., Chicago.

One 7½-ton electric crane, 17-foot span, for Westinghouse Electric & Mfg. Co., Brooklyn, to Armington Engineering Co., Euclid, O.

Orders Pending

One trolley for the West Penn Power Co. in addition to the two 6-ton special bucket trolleys awarded the Milwaukee Electric Crane & Mfg. Co. incorrectly noted last week as three.

Cranes for the Greenville Steel & Iron Co.; bids about to be asked.

One 2-ton crane or hoist for the Heinz Co., Pittsburgh; bids being taken.

One 5-ton crane for the Pittsburgh Valve Foundry & Construction Co., Pittsburgh; bids being taken.

One 125-ton, 4-motor crane, 52-foot 6-inch span, with 100-ton main hoist and 15-ton auxiliary, for United Gas Improvement Co., Philadelphia, for installation at Devon, Conn.

Two used 5-ton electric cranes, 60 to 70-foot span, for F. B. Cutter, 50 Church street, New York.

One 15-ton locomotive crane, 50-foot span, for American Car & Foundry Co., 165 Broadway, New York.

Two 150-ton electric cranes for Brooklyn Edison Co., Pearl street, Brooklyn; action expected shortly.

The recent improvement in demand is being very well maintained, and prices continue to stiffen. This is also noticeable in crane prices, an advance of at least 5 per cent having been placed in effect recently on a general average. Business in cranes, while a little slower this week, is of fair volume.

Demand for foundry equipment in this district is of a spotty character. Some fair buying was indulged in about the middle of September, but since then demand has shown a noticeable falling off. A feature of the market has been the fairly large amount of business done in the rebuilding of molding machines. The American Foundry Equipment Co. reports receiving orders for rebuilding molding machines from the Nute, McGee & Cleary Co., Chambersburg, Pa., the Reading Foundry Supply Co., Reading, Pa., the Burnside Steel Co., Chicago, and the Toledo Steel Castings Co., Toledo, O. This company also reports having booked orders for sand cutting machines from the Packard Motor Car Co., Detroit, the Pullman Co., Chicago, and for two heavy units from the Erie Malleable Iron Co., Erie, Pa. Makers of flasks report demand for aluminum snap flasks is heavy in this territory. Electric furnace manufacturers do not report any outstanding business here but say a good many prospects appear to be reaching the closing stage.

Lethargy Descends Upon Market

PITTSBURGH, Oct. 3.—Lethargy to a greater or less extent appears to have settled upon the equipment market. New inquiries for cranes this week are few, one being issued for two cranes and another for a single installation. While inquiries for machine tools still are numerous, purchases are withheld except in the case of a needed tool or two here and there. One or two dealers, however, report inquiries have fallen off along with the decreased buying rate. One of the largest equipment inquiries now current is that of the Greenville Steel & Iron Co. which is to erect a rolling mill, openhearth building, machine shop, power house and warehouse at Greenville, Pa. In addition to cranes a machine tool list calls for one radial drill, four drill presses, two planers, three roll turning lathes, and several grinders as well as other machinery. H. E. McConnell of Cleveland, formerly of Mingo Junction O., as general manager, is understood to have charge of purchases. In addition to some foundry equipment, the Titusville Iron Works, Titusville, Pa., also is scheduled to purchase machine shop equipment. Sales of the week include an axle, lathe, hand milling machine, a lathe to a nearby coal company, a small one to a nearby shop, one each 16-inch by 6-foot and 26-inch by 10-foot lathes, one 20-inch drill press, and other single items of that nature including several grinders. One or two cranes likewise have been sold as well as several hoists. Current inquiries call for one or two items at a time such as shears, shapers, milling machines, etc.

Sellers of foundry equipment report the major portion of September was quiet from a selling standpoint although latterly buying of smaller equipment and supplies has measurably improved. Several electric sand sifters, vibrators, ladles, and ladle driers, flasks, riddles, etc., have been sold as well as one or two molding machines. Recent purchasers of molding machines from the Herman Pneumatic Machine Co., include the Brown Car Wheel Co., Buffalo, and the National Car Wheel Co., Rochester, N. Y. One of the largest items before the molding machine trade is a complete foundry installation for a steel foundry in Alabama which involves 20 or more large and small molding machines as well as considerable other equipment. A local foundry recently purchased a 5-ton cupola and one or two other cupola inquiries from users in this vicinity still are pending. Several inquiries for grinding machines are current from nearby foundries.

Volume of Orders Is Fair

CLEVELAND, Oct. 3.—Orders for machine tools and shop equipment in this district continue on a par with that of a week ago. No outstanding business has been done, but dealers report the volume of miscellaneous single tool awards has been sufficiently large enough to keep them fairly busy. Secondhand machinery continues to be in greatest demand, but dealers state more of a tendency is being shown by buyers to take new machinery than at any time in the past two years. This is particularly true of the larger buyers, who, in practically all cases within the past few weeks, have been filling their needs with new tools. As a result of this renewed buying, machine tool building shops are steadily increasing operations and little is heard from manufacturers regarding inability to obtain enough business to keep their shops running. Secondhand machinery of quality is becoming scarce and as a result dealers in this class of tools are showing more interests in auctions. Two large government auctions, scheduled for this week, one at Toledo, O., and the other at Erie, Pa., are expected to draw a large attendance.

While inquiries of size are lacking, ones invloving one and two machines are numerous. Some of those being worked on by dealers here include one from the Imperial Clock Co., Collinsville, Ill., for three multiple-spindle drill presses, three precision lathes, gear cutters, milling machines, screw machines, saws, grinders, punch presses, etc.; one from the Herman Tire Buiding Machine Co., St. Marys, O., for a drill press, lathe, grinders and shapers; and one from the Greenville Steel & Iron Co., Greenville, Pa., for three roll turning lathes, one radial drill, four drill presses, two planers and several grinders.

Machine tool prices continue to rise and indications are that they will go to even higher levels before the end of the year. Material and labor costs continue to mount and manufacturers are unable to continue selling their products at prices established during the depression. During the past week the Cincinnati Planer Co., Cincinnati, announced an advance of approximately 10 per cent on its line of vertical boring and turning mills. This advance was made effective Oct. 1.

Industrial operations continue to gain steadily and on the whole average between 75 and 100 per cent. However, manufacturers are not adding to their equipment unless forced to by necessity and as a result orders are confined to single units as a rule. Probably the largest machinery buying is being done by the automotive trade. The railroads are doing little buying in this district although a number of manufacturers have received some business from this source within the past few weeks.

Machine Tool Demand Improving

CHICAGO, Oct. 3.—General demand for machine tools is improved. Orders are coming from a wide variety of sources and are scattered. Salesmen find machine tool users much more inclined to talk over their requirements and considerable scattered business is being picked up in this way. It is noted that most demand is for manufacturing equipment, largely automatic, and of moderate weight. Standard equipment, such as is used in tool rooms, is not in as much demand, as production seems to be the aim of most shops now and special machinery is desired for that purpose. Neither the light types of equipment nor the extremely heavy are in strong demand, but a betterment is expected very soon.

Railroad buying now is not a strong factor, although the Rock Island railroad continues to buy a few tools occasionally on its recent inquiry. The Burlington railroad has not yet begun to place its orders, although action by this road is expected at any time. The International Harvester Co., recently bought some drills, boring mills, gear hobbers and other equipment for its tractor plant. Prices generally are moving upward and advances on engine lathes have been made as much as 15 per cent on some lines, while others have made unequal changes to readjust relative values. A new list on shapers is in effect Oct. 1, which is an advance of about 20 per cent over former prices.

Although the Missouri, Kansas & Texas railroad does not buy in this market, it is interesting to note it is in the market for about 37 lathes, six crank shapers, six radial drills, two boring mills, five milling machines, three grinders and some miscellaneous equipment.

Equipment Demand Is Growing

BOSTON, Oct. 3.—Following the recent settlement of the textile strike in New England demand for tools from textile plants and manufacturers of textile machinery has come out and a fairly large amount of recent sales have been in this line. A textile machine manufacturer in Maine bought a planer and lathe during the week, and Massachusetts textile machine manufacturers have been in the market for individual tools. Dealers report a better sentiment in the trade, and tool manufacturers point to definite increases in orders. A recent machine tool exhibit in New Haven, Conn., stimulated interest among tool users. Tool sales of the past week include a heavy duty planer to an engine manufacturer, a plate bending roll costing from $12,000 to $14,000 to a ship building interest, several lathes to schools, and a 3-foot radial drill to a Boston shop. Prices are firm with recent sales of used equipment showing advances over prices of similar equipment a month ago.

Inquiry of the past week was encouraging. A manufacturer in Providence has a list of tools out totalling about $15,000. The General Electric Co., at Pittsfield, Mass., is inquiring for seven tools. A Massachusetts paper manufacturer is in the market for two or three tools, and several local machine shops are on the point of adding to their equipment.

Crane inquiry is reported more active than in several months. Two 5-ton industrial cranes are up for bids at the present time, and at least three cranes of larger sizes are expected to be placed in the near future. Recent inquiry for an electric hoist is but one of many inquiries for material handling equipment.

Most Orders from Auto Builders

MILWAUKEE, Oct. 3.—Automobile manufacturing centers furnish the bulk of current demand for metalworking machinery. While some business has developed among railroad shops and concerns supplying railroads, the volume of such business is below expectations. Inquiries are more frequent and definite. The trade is looking for some business from the conversion of the Samson Tractor Works in Janesville, Wis., to an automobile plant by the General Motors Corp. At the same time the Allis-Chalmers interests here are preparing to make full use of a big tractor works erected in the last three years, transferring some departments temporarily using parts of this plant to a new structure now being built. Paper mill, woodworking and miscellaneous machinery plants are showing renewed activity in new construction. New public garage and repairshop construction also is active.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

ANNISTON, ALA.—The Kilby Pipe Co. has been incorporated by E. M. Kilby, C. A. Hamilton and Whitfield Clark.

BRIDGEPORT, CONN.—The Atlas Body Works have let the contract for a 1-story, 76 x 90-foot factory.

NORTH CANAAN, CONN.—The Canfield Motor Sales Co., Inc., has been incorporated to build machinery, automobiles, etc., with $50,000 capital by E. S. Canfield, P. B. Canfield, A. S. Dinan and E. M. King, both of New Marlborough, Mass.

NORWALK, CONN.—Meeker's Union Foundry Corp. has let the contract for a 1-story addition.

WATERBURY, CONN.—The Brass City Tool Co. is to erect a factory.

WINSTED, CONN.—The Winsted Edge Tool Works is building a 1-story, 30 x 40-foot factory addition.

ATLANTA, GA.—The Southern Wire & Iron Works has acquired a site at Dallas, Tex., on which it plans a plant at an estimated cost of $60,000.

CHICAGO—S. G. Robbins plans a 1-story machine shop at 4711-17 Lake street.

CHICAGO—The Troy Trailer & Wagon Co., 606, 29 South La Salle street, has been incorporated with $350,000 capital stock by E. M. Blamkenheim, Walker Butler and Joseph F. Cervinka. The company is represented by D. M. Healy, 1119 Conway building.

EAST ALTON, ILL.—The Western Cartridge Co. plans a brass mill addition, 1-story, 86 x 240 feet, to cost $50,000.

NORTH CHICAGO, ILL.—The Modern Automotive Mfg. Co., 2004 Sheridan road, has been incorporated with $15,000 capital stock by Alford E. Budde, Rosella B. Ivandick, and others. The company is represented by M. J. Ivandick, 45 Broadway.

VIENNA, ILL.—Elam & Upton, Inc., has been incorporated with $15,000 capital stock to manufacture electric current, by W. B. Elam, Colmore Upton, Earl R. Upton, and others.

BOWLING GREEN, KY.—The Metallic Casket Co. has been incorporated with $25,000 capital stock by J. E. Tyler, John and E. H. Davis.

BALTIMORE—Wolfe & Mann Mfg. Co., 320 South Hanover street, has been incorporated with $10,000 capital stock by Eugene L. Wolfe, William J. Mann Jr. and Samuel W. Wiley.

BOSTON—The Corner-Lock Mfg. Co. has been incorporated with $50,000 capital by Frank W. Everett, Brookline, Mass., Dwight W. Robinson, Newton, Mass., Eli R. Snyder, Natick, Mass., and others.

BOSTON—The Willey-Noyes Mfg. Co. has been incorporated to make motor vehicle appliances with $125,000 capital, by George H. Willey, Somerville, Mass., Edmund H. Noyes, Braintree, Mass., and H. G. O'Connor.

CAMBRIDGE, MASS.—The Boston Woven Hose & Rubber Co. plans a 1-story factory addition, 43 x 82 feet.

EVERETT, MASS.—The Sexton Can Co., 31

Cross street, has awarded a contract for a 1-story plant addition.

EVERETT, MASS.—The Everett Factories & Terminal Corp. has been incorporated with $500,000 capital stock. Ralph Thurston is president.

EVERETT, MASS.—The Boston Elevated railway has awarded the contract for substructures and foundations for two car repair shops and a transfer shop. The estimated cost, complete, is $3,000,000.

GLOUCESTER, MASS.—The Burnham Marine Railways Co. has been incorporated with $30,000 capital stock. T. Ralph Foley is president.

LOWELL, MASS.—The Saco-Lowell Shops has let the contract for a 1-story, 72 x 170-foot foundry addition.

LYNN, MASS.—Bids have been closed for a 1-story factory building for the Thomson Electric Welding Co.

MALDEN, MASS.—The Frank B. Cyr Co. has been incorporated to deal in machinery, etc., with $15,000 capital and 500 shares without par value by Barnard Bachner, Frank B. Cyr and Lewis Calhoun.

MILFORD, MASS.—The Hopedale Mfg. Co., builder of textile machinery, has increased its capital stock from $450,000 to $1,000,000.

RANDOLPH, MASS.—The Murray-Mack Co., builder of automobiles, is to erect a factory adjacent to the Randolph Foundry Co.

SPRINGFIELD, MASS.—The Springfield Bronze Co. has let contract for a foundry addition, 30 x 40 feet.

SPRINGFIELD, MASS.—The Indian Orchard Co. plans a boiler house at an estimated cost of $80,000.

WEST LYNN, MASS.—The General Electric Co. is having plans prepared for a 4-story, 122 x 157-foot addition, to cost $200,000.

WORCESTER, MASS.—Wickwire Spencer Steel Corp. has awarded the contract for a 3-story, 33 x 100-foot factory, to cost $45,000.

WORCESTER, MASS.—The Norton Co., manufacturer of grinding wheels, awarded the contract for a 4-story, 50 x 125-foot factory, estimated to cost $75,000.

WORCESTER, MASS.—Plans are being made for a 1-story factory to contain 30,000 square feet for the Parker Wire Goods Co., on the site of the old Star Foundry, which was recently bought by Edward D. Priest, Schenectady, N. Y., now the principal owner of the company.

DETROIT—The E. J. Woodison Co. plans to establish a warehouse in Milwaukee.

DETROIT—The Burr-Patterson Co., 4211 Woodward avenue, plans a 2-story plant, 40 x 105 feet to cost $50,000.

DETROIT—The American Twist Drill & Tool Co., 2804 West Jefferson avenue, recently was damaged by fire.

DETROIT—The Aman Foundry Co. has been incorporated with $10,000 capital stock by John Aman, and others.

DETROIT—The Acme Saw Co., 522 Fort street west, has been incorporated to manufacture bandsaws, by H. E. Culverwell, Donald J. Bryant and Francis H. McCarthy.

HAMTRAMCK, MICH.—The Briggs Mfg. Co. plans a 1-story power house, 80 x 83 x 50 x 37 feet.

JACKSON, MICH.—The Hayes Wheel Co. plans a 1-story factory and power plant, 100 x 160 feet, to cost about $250,000.

KALAMAZOO, MICH.—The Kalamazoo Blow Pipe Co. is drawing plans for a 5-story factory and office building.

MONROE, MICH.—Th Monroe Auto Equipment Co. is erecting a foundry building, 64 x 100 feet.

SAGINAW, MICH.—The Baker Perkins Mfg. Co. plans a power plant addition.

BLOOMFIELD, N. J.—The Westinghouse Lamp Co. plans a gas producer building.

CAMDEN, N. J.—The J. B. Van Sciver Co. has awarded a contract for a 1-story power house, 32 x 48 feet.

CAMDEN, N. J.—The Gilliam Mfg. Co., machinery, has been incorporated with $250,000 by F. R. Hansell, John A. Macpeak and I. C. Clow.

CLIFTON, N. J.—The Cupra Silk Co. plans a boiler house building.

PATERSON, N. J.—The Paragon Can & Cap Co., of Brooklyn, has a long-term lease on a 2-story factory building in Clay street. Robert A. Russell is president.

PATERSON, N. J.—The Ackerman Rubber Co. has been incorporated with $250,000 capital stock by Frank P. Ackerman, Levitha M. Seed and Wallace M. Seed.

PATERSON, N. J.—The Pompton Iron Co. has been incorporated with $250,000 capital stock by Fred Weller, H. M. Search and Arthur Search.

TRENTON, N. J.—The Magnetic Pigment Co. plans a factory and boiler house addition at an estimated cost of $50,000.

TRENTON, N. J.—The Panelyte Board Co., Smith building, has acquired a site on which it plans a plant for the manufacture of fiber products. The com ny recently was organized with $300,000 capital stock by D. Mason Sutherland Jr., and others.

ALBANY, N. Y.—The general contract for a $75,000 garage has been awarded by Kushner & Coopersburg. The structure will be 2-stories, 65 x 240 feet.

ALBANY, N. Y.—The Electric Supply & Equipment Co., Hartford, Conn., has awarded the contract for a 4-story, 42 x 63-foot factory, to cost $50,000.

BROOKLYN, N. Y.—The Anderson Sheet Metal Co., Providence, R. I., has leased a 1-story building at 185-87 Seventh street, this city.

BROOKLYN, N. Y.—The Louis Huetwohl Brass Foundry recently was incorporated with $50,000 capital stock by C. Huetwohl, G. and L. Schimper. The company is represented by I. Phillips, 303 West 122nd street.

BROOKLYN, N. Y.—The Bay Ridge Polishing & Plating Co. has been incorporated with $10,000 capital stock by P. Larkin, T. Collins and C. Lynn. The company is represented by H. Messard, 305 Broadway.

BROOKLYN, N. Y.—Paul A. Petchler, engines and machinery, has been incorporated with $20,000 capital stock by A. Petchler, P. and N. Wulfken. The company is represented by G. F. Mason, 391 Fulton street.

BROOKLYN, N. Y.—The Artcraft Iron Co. has been incorporated with $5000 capital stock by H. Kern, J. Stark and J. Valenti. The company is represented by N. Cohen, 208 East Broadway.

BROOKLYN, N. Y.—The Brooklyn Screw Machine Products Co. has been incorporated with $15,000 capital stock by E. H. Coller, R. W. Johnson and N. A. Carpenter. The company is represented by Coller & Coller, 277 Broadway.

BUFFALO—The Buffalo Bronze Die-Casting Co., 90 Arthur street, plans a plant addition.

BUFFALO—The Keystone Tool & Metal Parts Corp., 65 Oak street, plans a 1-story plant addition, 34 x 75 feet.

DUNKIRK, N. Y.—The Skelton Shovel Co. plans a 1-story factory building.

GENEVA, N. Y.—The Lisk Mfg. Co. has let a contract for a factory building, 160 x 280

Business Changes Recently Announced

THE Cleveland office of the Asa S. Cook Co., Hartford, Conn., manufacturer of wood screw and automatic bolt machinery, is to be moved from 319 Superior building to 344 Engineers building. Ernest W. Duston is in charge of the Cleveland office which covers Middle West territory.

* * *

Change of address of the Stevens-Prentice Mfg. Co., Milwaukee, manufacturer of inclinometers, from 62 Mason street to 377 National avenue, is announced.

* * *

New England and southern branches of the Brown Instrument Co. have been established at 185 Devonshire street, Boston, with George Goodman in charge, and at 619 Brown-Marks bulding, Birmingham, Ala., with Charles L. Saunders in charge.

* * *

Sales offices have been opened at 305 Merchants Bank building, Indianapolis, by the Chicago Flexible Shaft Co. with F. W. Odemar in charge.

* * *

The B. C. Ames Co., Waltham, Mass., has acquired a substantial interest in the Triplex Machine Tool Corp., which will continue its general offices and show room at 18 East Forty-first street, New York.

* * *

Effective Oct. 15, New York offices of the Fougner Concrete Steel Co., recently bought by the Paul J. Kalman Co. and to the Kalman New York branch, are to be moved from 9 Broadway to 110 East Forty-second street.

feet. C. C. Keehn is president of the company.

HUDSON, N. Y.—The Holbrook Co., automobile body manufacturers, has awarded the contract for a manufacturing and service building, to cost $80,000.

JAMESTOWN, N. Y.—The Watson Mfg. Co. plans a 4-story addition, 20 x 99 feet.

JAMESTOWN, N. Y.—The International Casement Co., 84 Hopkins street, maker of window casements, has awarded a contract for a 1-story plant addition, 120 x 150 feet, estimated to cost $50,000.

LANCASTER, N. Y.—The Lancaster & Depew Light & Power Co. plans an office building to cost about $40,000.

LOCKPORT, N. Y.—The Lockport Foundries Corp. plans a 1-story machine shop.

LOCKPORT, N. Y.—The Harrison Radiator Co. has plans for a 3-story factory building, 150 x 300 feet.

LONG ISLAND CITY, N. Y.—The general contract for a garage and storehouse for the New York & Queens Electric Light & Power Co. has been awarded to the Tidewater Building Co. It will be 2-stories, 89 x 150 feet.

NEW YORK—The Braden Copper Co., 120 Broadway, plans to enlarge its copper plant.

NEW YORK—The Shenandoah Steel & Iron Corp. has leased a 4-story building, 40 x 100 feet, at 230-32 West Thirty-eighth street.

NEW YORK—A $75,000 garage will be erected by A. Lewisohn, 61 Broadway. The structure will be 2-stories, 175 x 230 feet.

NEW YORK—A $300,000 warehouse will be erected by the Republic Storage Co. Plans call for a 9-story building, 75 x 158 feet.

NEW YORK—The Turner Construction Co. has been awarded the contract for a 1-story warehouse, 77 x 165 feet, for the United Plumbers' Supply Co.

NEW YORK.—The Zarco Mfg. Co., auto parts, has been incorporated with $100,000 capital stock by E. E. Zideck, J. Dorr and S. Dilligan, 67 Derve street.

NEW YORK.—Miller & Weissman, iron work, have been incorporated with $5000 capital stock by H. Miller, J. Weissman and S. Wilpon. The company is represented by Gold & Maran, 277 Broadway.

NEW YORK.—The Mack Lock Co. has been incorporated with $20,000 capital stock by C. Mack, C. Nessler and others. The company is represented by H. G. Wenael Jr., 46 Cedar street.

NEW YORK—The Pruver Electric & Machine Co. has been incorporated with $5000 capital stock by D. and A. Pruver. The company is represented by A. Weiss, 154 Nassau street.

NEW YORK—The Donnelly Dry Dock Co. has been incorporated with $250,000 capital stock by W. T. and N. E. Donnelly and D. W. Barnes. The company is represented by White & Case, 14 Wall street.

NEW YORK—The Welfare Gas Range Co. has been incorporated with $10,000 capital stock by L. and B. Fishman and W. J. Porcella. The company is represented by Krulewitz & Porcella, 305 Broadway.

NEW YORK—The Adjustable Steel Ventilator Corp. has been incorporated with $5000 capital stock by S. E. Markman, R. T. Barko and B. M. Blumenthal. The company is represented by R. Barko, 51 Chambers street.

NEW YORK—The Peckham Seamless Ring Mfg. Co. has been incorporated with $25,000 capital stock by W. A. Nixon, J. J. Boedigheimer and C. J. Murphy. The company is represented by Flaherty, Turner & Strouse, 2 Rector street.

ROCHESTER, N. Y.—The Electric Storage Battery Co., 181 South Clinton street, plans a factory building.

SCHENECTADY, N. Y.—The General Metalsmiths, Inc., has plans or a 1-story, 58 x 250-foot factory building.

SYRACUSE, N. Y.—The United States Hoffman Machinery Co., 329 Temple street, plans a plant addition.

SYRACUSE, N. Y.—The Allen Tool Corp. has been incorporated with $20,000 capital stock by C. T. Allen, A. and M. L. Burkinshaw. The company is represented by Stillwell, Viall & Skerritt.

UTICA, N. Y.—The Utica Heater Co. plans a 1-story warehouse, 72 x 100 feet, to cost about $100,000.

HIGH POINT, N. C.—The plant of the P. A. Thomas Car Works, Inc., recently was damaged by fire.

AKRON, O.—The Die Sinking & Rubber Mold Co. has been incorporated with $10,000 capital stock by William H. Barkwill, M. R. Barkwill, S. W. Sweet, W. A. Heffiman and Henry Kish.

ASHTABULA, O.—The Saybrook Light, Power & Water Co. has been incorporated with $10,000 capital stock by J. P. Dodge, L. Heath, E. D. Richards, Max E. Frost and C. R. Busse.

CLEVELAND—The T Hold Mfg. Co. has been incorporated with $1000 capital stock by

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.25c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	2.95c to 3.10c
Cleveland	2.91c
Detroit	2.90c
New York	3.04c
Philadelphia	3.025c
San Francisco	3.40c
Seattle	3.60c
St. Louis	2.90c
St. Paul	3.05c
Los Angeles	3.50c

IRON BARS

Boston	3.35c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	3.10c
Detroit	2.90c
New York	2.94c
Philadelphia	3.025c
St. Louis	2.90c

SHAPES

Boston	3.35c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	3.05c to 3.20c
Cleveland	3.01c
Detroit	3.00c
New York	3.14c
Philadelphia	3.125c
San Francisco	3.40c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.60c

PLATES

Boston	3.35c
Boston 3/16-inch	3.04c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	2.95c to 3.20c
Cleveland	3.01c
Detroit	3.00c
New York	3.14c
Philadelphia	3.125c
San Francisco	3.50c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.65c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.15c
Buffalo	4.05c
Chicago	4.00c
Cincinnati	3.75c to 4.00c
Cleveland	3.70c to 3.76c
Detroit	3.95c
New York	4.19c
Philadelphia	3.85c
San Francisco	4.50c
Seattle	4.85c
St. Louis	4.10c
St. Paul	4.25c
Los Angeles	4.70c

NO. 28 BLACK SHEETS

Boston	5.40c
Buffalo	4.85c
Chicago	4.85c
Cincinnati	4.00c
Cleveland	4.40c
Detroit	4.90c
New York	4.90c
Philadelphia	4.60c
San Francisco	6.05c
Seattle	5.85c
St. Louis	4.95c
St. Paul	5.10c
Los Angeles	6.10c

NO. 28 GALVANIZED SHEETS

Boston	6.40c
Buffalo	5.85c
Chicago	5.85c
Cincinnati	5.20c
Cleveland	5.40c
Detroit	5.90c
New York	5.90c
Philadelphia	5.75c
San Francisco	6.90c
Seattle	6.85c
St. Louis	5.95c
Los Angeles	6.90c

BANDS

Boston	4.25c
Buffalo	3.90c
Chicago	3.55c
Cincinnati	3.70c to 3.85c
Cleveland	3.61c
Detroit	3.70c
New York	3.84c
Philadelphia	3.825c
San Francisco	4.05c
Seattle	4.35c
Los Angeles	4.40c

HOOPS

Boston	4.75c
Buffalo	4.10c
Cleveland	3.61c
Detroit	3.95c
New York	4.39c
Philadelphia	4.25c
Seattle	5.00c

COLD ROLLED SHAFTING

Boston (rounds)	4.00c
Buffalo	3.95c
Chicago (rounds)	3.90c
Cincinnati (rounds)	3.75c
Detroit (rounds)	3.80c
New York	3.90c
New York (flats, squares and hexagons)	4.40c
Philadelphia (rounds)	3.85c
San Francisco	5.00c
Seattle	5.25c
Los Angeles	5.10c
Boston (flats, squares and hexagons)	4.50c

William Firth, C. N. Horringshow, E. W. Philpott, W. G. Dillon and A. C. Smith.

CLEVELAND.—The Walker Piston Co. has been incorporated with $500 capital stock by William A. McAfee, East Ohio Gas building, Maurice F. Hanning and others.

CLEVELAND—The Reliance Heating Co. has been incorporated with $10,000 capital stock by Jacob Helmkee, Homer W. Badgett, Floyd E. Shannon, Charles Reis and Charles D. Trout.

COLUMBUS, O.—The Standard Belt Co. plans to rebuild its plant which was damaged by fire.

COLUMBUS, O.—The Adam Loos Boiler Works Co. has been incorporated with $10,000 capital stock by Adam Loos, Adam J. Loos, George Loos, Herman W. Loos and Elsie K. Loos.

COLUMBUS, O.—The Superior Die Tool & Machine Co. has been incorporated with $28,287.36 by Charles A. Field, Stewart A. Hoover, G. M. Armbruster, D. C. Throckmorton and H. B. Tingley.

DAYTON, O.—The Frank Ault Tool & Production Co. has been incorporated with $20,000 capital stock by Frank Ault, William F. Miller and others.

FINDLAY, O.—The Adams Axle Co. plans to enlarge its plant by the erection of a building, 80 x 200 feet.

LIMA, O.—The Vapo Stove Building Co. has been incorporated with $35,000 capital stock by G. O. Dupuis, J. T. Kaufman, Elmer D. Webb, Glen C. Webb and A. G. Sawyer.

TOLEDO, O.—The Peerless Plating Co. has been incorporated with $6000 capital stock by H. A. Middleton, Edwin Williams, Edwin R. Thurston, Walter A. Eversman and Charles W. Racine.

UHRICHSVILLE, O.—Gallagher Bros. are erecting an addition to their machine shop.

BOYERSTOWN, PA.—Eastern Foundry Co. has awarded a contract for a foundry building, 98 x 150 feet.

GREENVILLE, PA.—The Greenville Steel & Iron Co. plans a plant.

McKEES ROCKS, PA.—The Chesebrough Mfg. Co. plans a manufacturing plant.

PHILADELPHIA—Bids will be received shortly on a switch plant for the General Electric Co. at Seventh and Willow.

PHILADELPHIA—Plans are in progress for three factory buildings for the John B. Stetson Co.

PHILADELPHIA—Bids will be closed Oct. 6 by Clarence E. Wunder, architect, on a 2-story factory building for Humphreys & Co.

PHILADELPHIA—A $150,000, 8-story factory building will be erected by L. Laveson & Son. The Kober Construction Co. has been awarded the general contract.

PHILADELPHIA—The Taplet Mfg. Co. has been incorporated with $175,000 capital stock to manufacture electrical devices, etc., by Edward A. Jenkins, Swarthmore, Pa., Charles F. Jenkins, and C. W. Merembeck, 2555 East Morris street, Philadelphia.

PITTSBURGH—The Hanlon-Gregory Galvanizing Co. plans a 1-story mill building, 100 x 400 feet.

READING, PA.—The Reading Rubber Co. has purchased the box factory of Jacob K. Boyer, at Kutztown, Pa., and will make extensive alterations including the installation of $20,000 of machinery.

ROSSMERE, PA.—The Rowe-Stuart Motors Corp. has awarded a contract for a 1-story plant, 120 x 300 feet.

WILLIAMSPORT, PA.—W. D. Crooks & Son, Park street, have had plans prepared for a 2-story plant addition, 125 x 160 feet, to cost $75,000.

WILKES-BARRE, PA.—The Kelly Run Crushed Stone Co. has been incorporated with $5000 capital stock by H. B. Gibby, E. B. Gibby and William Bodmer.

PAWTUCKET, R. I.—The W. R. Cobb Co. has been incorporated to make jewelry with 500 shares no par value by Edgar E. Baker, George C. Wiltshire and Fred W. Hall.

PROVIDENCE, R. I.—The general contract has been awarded for a $150,000 garage and service station for the New Downtown Garage, Inc.

PROVIDENCE, R. I.—The F. A. Whiting Co. has been incorporated make jewelry with $60,000 capital stock by M. B. Taft Whiting, Chester A. Salisbury and Ralph Rathbun.

GREENVILLE, S. C.—The Southern Bobbin & Spool Co., recently organized with $100,000 capital stock, has awarded contract for a 2-story plant building, 40 x 130 feet, to cost $35,000.

KNOXVILLE, TENN.—The Knoxville Power & Light Co. is arranging an increase in its capital stock to finance extensions and improvements.

MEMPHIS, TENN.—The Burglar Proof Shutter Corp. has been incorporated with $100,000 capital stock by P. J. Quigley, E. L. Liming and George H. Poole.

HUNTINGTON, W. VA.—The Safety Appliance Co. has increased its capital stock to $10,000.

ALGOMA, WIS.—A dry kiln addition and a factory extension, 50 x 160 feet, will be built by the Algoma Panel Co.

FOX LAKE, WIS.—Work will be started about Nov. 1 on foundations for the factory of the Six Wheel Truck Co. F. N. Pettegrew is president and chief engineer.

JANESVILLE, WIS.—Metal specialties, toys and novelties will be manufactured by the Nickerbacker Novelty Co., incorporated for

New Trade Publications

DRYING FINE MATERIALS—The Colorado Iron Works Co., Denver, has published a 31-page illustrated booklet in which the problems of drying fine materials are discussed. Equipment for drying is described in detail in reference to construction, capacity, efficiency and cost of operation. Installations and details of the operating mechanism are included in the illustrations.

TOOL STEELS—A 27-page booklet has been published by the McInnes Steel Co., Ltd., Corry, Pa., in which hammered crucible tool steels are described. Treatment of the various steels, such as tempering, hardening, annealing, etc., is described. The booklet also contains some general information, including a number of tables.

ILLUMINATION—The Skybryte Co., Cleveland, is circulating a 48-page illustrated book which describes the advantages of daylight as a means of illumination. Special mention is made of the diffusion of the light from the sun by the atmosphere, the light that may be had by using the proper glass areas, and the cleaning necessary to obtain the maximum amount of light.

LINE SHAFTING EQUIPMENT — The Medart Co., St. Louis, has published a 182-page illustrated catalog in which line shafting equipment is described and illustrated. This condensed catalog presents facts about the most generally used line shafting equipment and its aim is to state dimensions, details of construction, etc., in a way to aid engineers, designers, mechanics, etc., in planning installations. Complete specifications are given.

SCREWS AND BOLTS — The Superior Screw & Bolt Mfg. Co., Cleveland, has published a 78-page illustrated booklet in which its various products are described and illustrated. These include cap screws, set screws, semifinished nuts, stove bolts and stove rods, carriage, machine and plow bolts, rivets, special bolts, etc. In addition to the information given on the various products, the booklet contains a number of interesting tables and miscellaneous information.

ENGINEERING TABLES—P. H. & F. M. Roots Co., Connersville, Ind., has published a 32-page illustrated booklet giving engineering tables and formulas supplying all the information required by the users of blowers, gas exhausters and pumps. Charts on the flow of air in pipes, flow of air through orifices, flow of gas in pipes, shrinkage in volume of foul gas, and flow of water in pipes, all of which greatly simplifies the work of calculating the pipe friction, velocities, etc., are contained in the booklet. Information also is given on agitation of liquids, oil burners, pneumatic conveyors, air requirements for various services, power requirements and calculation of gear drives. Other useful information frequently required by the engineer is listed in the last pages of the booklet.

AUTOMATIC PLATE VALVE—The Leinert Valve Co., Chicago, is circulating an illustrated folder in which automatic plate valves are described and illustrated. The valve consists only of three main parts—valve seat, valve stop plate and springs assembled and the bolt. According to the folder, the design of the valve, using radial springs, makes possible a large lift area. Its simplicity of construction and freedom from friction and wear are said to make it especially adapted to blowing engines, air, gas and ammonia compressors, vacuum pumps, automatic relief valves, etc.

GRAPHIC INSTRUMENTS—Automatic control signalling and alarm instruments are described and illustrated in a 24-page illustrated booklet recently published by the Brown Instrument Co., Philadelphia. The equipment includes automatic control pyrometers as installed on electric furnaces, gas fired and oil fired furnaces; indicating control thermometers; recording control thermometers; indicating and recording pyrometers; signalling instruments and control switches and panels for electrically heated devices. In addition automatic control valves are described.

LATEST EDITION. **The Troy Times** LATEST EDITION.

VOL. LII.—NO. 214. TROY, N. Y., THURSDAY AFTERNOON CENTS PER WEEK.

Troy, N. Y., is the greatest collar manufacturing center in the world—but has other important manufacturing interests, as well. The Troy Times here quotes from the editorial pages of The Iron Trade Review. The Times is one of the leading newspapers of that city, established in 1851

The Forerunner of Achievement.

(From The Iron Trade Review.)

A hum-drum sort of world this is, our daily tasks hedging us close about, circumscribing ordinary mortals within close confines of thought, speech and action. The average man finds it difficult to get away from a strictly matter-of-fact viewpoint, considering little more than the solution of the problems with which he is immediately confronted. What a refreshing experience it was, therefore, for the 1,100 representatives of the iron and steel industry who heard the speech of Dr. John S. Unger at the banquet of the American Iron and Steel Institute. How rudely he rocked all the accepted theories about conservative speech.

400 Newspapers Regularly Quote

THE IRON TRADE REVIEW

CLEVELAND

The international reputation and the World-wide circulation of THE IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

$15,000 by J. Gross Jr., T. M. McQuaid and J. T. Griffin, all of Janesville.

MILTON, WIS.—The Burdick Cabinet Co., cabinets, panels, veneers, etc., will build a 1-story manufacturing addition, 80 x 160 feet.

MILWAUKEE—A 1-story addition, 54 x 200 feet, will be erected for the Rockwell Mfg. Co., 576 Park street.

MILWAUKEE—The Shadbolt & Boyd Iron Co., 129 West Water street, will build a 1-story warehouse, 100 x 110 feet, at Wright and Dousman streets. Price Davis is manager.

MILWAUKEE—A 3-story plant addition, 131 x 138 feet, will be built at Thirtieth and Clark streets by the Milwaukee Woven Wire Works at a cost of $50,000. William F. Johnson is general contractor.

NORTH MILWAUKEE, WIS.—The plant of the North Milwaukee Foundry Co. recently was damaged by fire.

OSHKOSH, WIS.—The plant of the Star Foundry recently was damaged by fire.

OSHKOSH, WIS.—The Juul-Petersen Mfg. Co., 83 High street, manufacturing furniture hardware, etc., has been purchased by the C. C. C. Co., 29 Main street, which manufactures patented combination folding bed-davenports. A new plant to house both companies will be built next spring.

PESHTIGO, WIS.—The Thompson Bros. Co., builder of power boats and other water craft, has started erection of a 3-story factory addition, 60 x 100 feet.

PLATTEVILLE, WIS.—The Mound City Mfg. Co., organized recently with $50,000 capital stock, is completing a machine shop, 40 x 100 feet, which will be equipped for the manufacture of the gardener's tools, etc.

RACINE, WIS.—The Philip Meyer Mfg. Co. has been organized with $25,000 capital stock to manufacture meat and food choppers, etc., by Philip, Ruth and John Meyer.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Mesabi Bessemer, 55 per cent iron	5.70
Old Range nonbessemer, 51½ per cent iron	5.20
Mesabi nonbessemer, 51½ per cent iron	5.05

PORT HENRY IRON ORE
Per Gross Ton, F.o.b., Port Henry

Old bed 21 furnace	$4.50
Old bed concentrates, 63 per cent	5.25
Harmony, cobbed, 63 per cent	5.25
New bed, low phos., 65 per cent	7.50
Lump ore for fix	6.00

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports.

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.50
Algerian low phosphorus, 52 to 54 per cent	10.50 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 68 per cent	9.00 to 9.50
Spanish foundry or basic, 52 to 54 per cent	8.50 to 9.50

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, 29½ cents per unit.

Indian 48 to 50 per cent c.i.f. Atlantic ports, nominal.

Caucasian, 52 per cent, c.i.f. Atlantic ports, 29 cents per unit.

Fluor Spar

Washed gravel, Kentucky and Illinois mines, per ton	$17.00 to 18.00

Rivets

Structural rivets, Pittsburgh	3.00c
Boiler rivets, Pittsburgh	3.10c
Rivets, ⅝-inch and smaller	65-5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank or tapped	$3.75 off list
Cold punched square or hexagon blank or tapped	$3.75 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	75 off
Cold punched semifinished hexagon nuts ⅝-incl. and smaller	80 off
Case hardened, finished, hexagon	65-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
⅜ x 6 inches, smaller and shorter

Rolled thread	50-10-10 off
Cut thread	50-10 off
Larger and longer	50-10 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread	60-10 off
Cut thread	50-10-10 off
Larger and longer	50-10-10 off
(⅜ x 4 inches, cold punched nuts)	
Cut thread	45-10 off
Larger and longer	45-10 off
Lag screws	60-10 off
Plow bolts Nos. 1, 2 and 3 heads	50-10 + 20 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50-10-10 off
Bolt ends with cold punched nuts	45-10 off
Blank bolts	50-10-10 off
Rough stud bolts with nuts	45-10 off

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
Butt Weld		
⅛-inch	51½	26
¼ and ⅜-inch	57	31½
½-inch	62	48½
¾-inch	66	54½
1 to 3-inch	68	56½
Lap Weld		
2-inch	61	49½
2½ to 6-inch	65	53½
7 to 8-inch	62	49½
9 to 12-inch	61	48½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	66	54½
Lap Weld		
2-inch	59	47½
2½ to 6-inch	63	51½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	47½	31
¼ and ⅜-inch	53	36½
½-inch	59	48½
¾-inch	64	53½
1 to 1½-inch	66	55½
2 to 3-inch	67	56½
Lap Weld		
2-inch	59	48½
2½ to 4-inch	63	52½
4½ to 6-inch	62	51½
7 to 8-inch	58	45½
9 to 12-inch	52	39½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	48	38½
¾ to 1½-inch	51	41½
2 to 2½-inch	53	43½
Lap Weld		
2-inch	47	38½
2½ to 4-inch	49	40½
4½ to 6-inch	48	39½
7 to 8-inch	44	31½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+ 7	+33
½-inch	26	8
¾-inch	32	17
1 to 1½-inch	34	19
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	29	15
2½ to 6-inch	32	19
7 to 12-inch	30	17
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+15	+48
½-inch	25	13
¾-inch	32	18
1 to 1½-inch	34	20
Lap Weld		
2-inch	30	17
2½ to 4-inch	33	21
4½ to 6-inch	32	20
7 to 8-inch	25	13
9 to 12-inch	20	8

DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+37½	+49½
¾-inch	+18	+30
1-inch	+34	+46
1¼-inch	+18	+30
1½-inch	+17	+29
Lap Weld		
2 and 2½-inch	+ 3	+15
3 to 4-inch	2	+ 7
4½ to 6-inch	1	+ 7
8-inch	+ 4	+ 8

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL	
1¼-inch	19½
2 and 2¼-inch	34
2½ to 3-inch	45
3¼ to 4-inch	50
CHARCOAL IRON	
1½-inch	2
1¾-inch	4
2 and 2¼-inch	14
2½ to 3-inch	19
3¼ to 4½-inch	21
SEAMLESS COLD DRAWN	
1-inch	53
1¼ and 1½-inch	45
1¾-inch	39
2 and 2¼-inch	32
2½ and 2¾-inch	36
3-inch	40
3¼ to 4-inch	45
4½ and 5-inch	37
SEAMLESS HOT ROLLED	
3-inch	42
3¼ to 4-inch	47

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base discount on all carbon steels except 0.30 to 0.40 per cent and 0.40 to 0.50 per cent carbon; direct shipment from mills in large quantities 88 off

On 0.30 to 0.40 per cent and 0.40 to 0.50 per cent carbon 86 off

Plus usual differentials and extras for cutting.

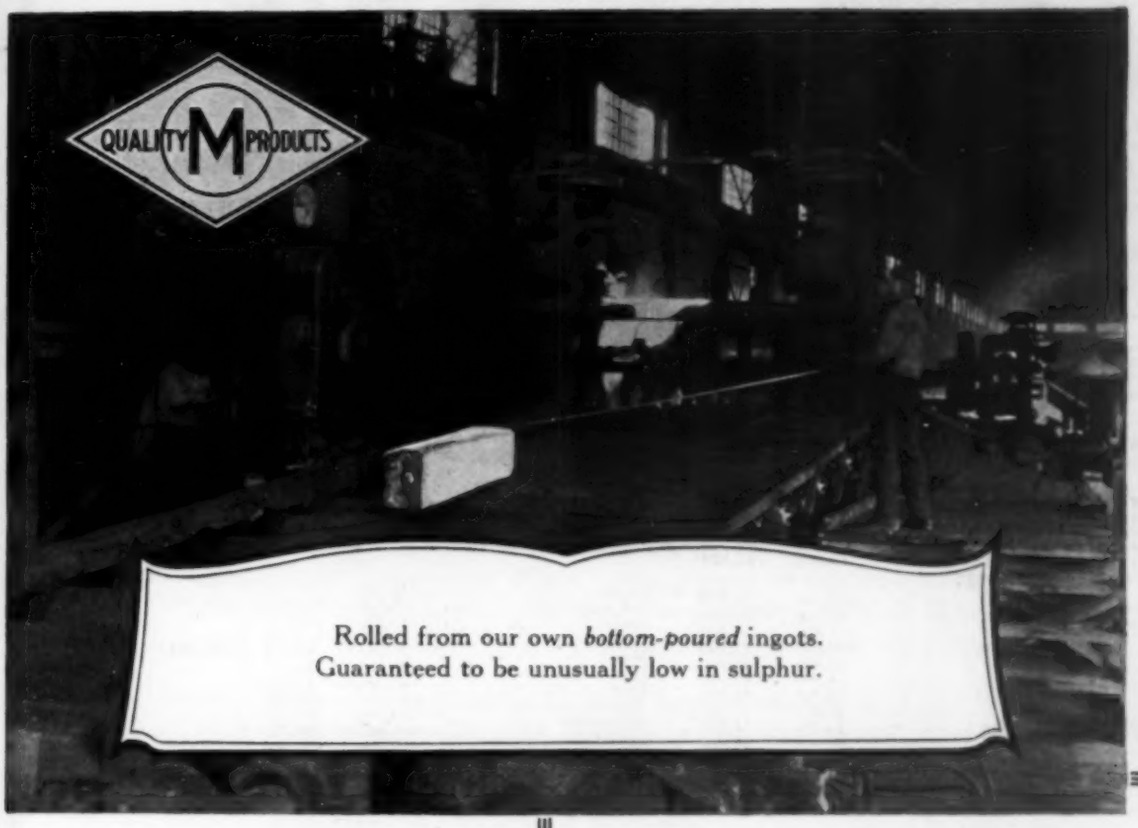
SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	12½c
2-inch	11-gage	13c
2-inch	10-gage	14½c
2¼-inch	12-gage	14c
2¼-inch	11-gage	14½c
2¼-inch	10-gage	16c
3-inch	7-gage	31½c
1½-inch	9-gage	11½c
5⅜-inch	9-gage	47c
5½-inch	9-gage	49c

Plus usual extras for forming and for long lengths.

MANSFIELD QUALITY SHEETS



A view of our 32" Blooming Mill

We Specialize

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock

METAL FURNITURE SHEETS

PICKLED and ANNEALED

ENAMELING STOCK

For Vitreous Enameling.

STOVE PIPE STOCK and ELBOW STOCK

UNIFORM COLOR BLUE

MILK CAN STOCK

We solicit your inquiries

The Mansfield Sheet and Tin Plate Co.

MANSFIELD, OHIO

District Sales Representatives

The L. D. Rockwell Co., No. 2 Rector St., New York, N. Y.; D. B. Coey, 1018 Standard Oil Building, Chicago, Ill.; Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.; The L. D. Rockwell Co., No. 1201 National Bank Bldg., Cleveland, O.; The Maynard French Steel Co., 516 Mercantile Library Building, Cincinnati, O.; Walter G. Clark, Inc., 106 N. Third St., St. Louis, Mo.; Walter G. Clark, Inc., 313 American Bank Bldg., Kansas City, Mo.; Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.; Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.; Mr. Herbert P. Hill, 401 Continentrl Trust Bldg., Washington, D. C.; Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.; Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.; Wm. P. Horn Co., Dekum Bldg., Portland, Oregon; Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.; Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ontario, Canada.

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	729,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	203,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	667,300	281,700	62,700	68,000
Monthly average 1921..	217,600	280,300	71,800	79,600
1921				
January	642,100	288,000	110,600	93,500
February	463,600	287,400	103,700	81,700
March	386,000	295,300	104,700	27,600
April	60,300	287,700	94,700	70,800
May	13,600	278,100	74,600	78,700
June	800	280,900	67,400	81,700
July	10,200	262,400	44,600	70,000
August	94,200	250,800	43,800	72,800
September	158,300	239,800	59,800	86,200
October	235,500	251,800	45,800	98,800
November	271,800	290,000	59,800	92,400
December	275,000	296,300	73,000	100,800
Total for 1921	2,611,400	3,308,500	862,500	955,000
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	.....	125,200	.....
August	411,700	.....	.....	.....

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
Average monthly 1921..	137,100	38,500	43,300	.....
1921				
January	157,800	44,200		
February	153,400	35,400	120,100	125,000*
March	156,100	33,900		
April	102,100	26,100		
May	81,900	31,700	95,500	36,000
June	84,500	20,700		42,100
July	103,600	30,300		45,100
August	141,500	16,100	130,600	61,200
September	206,100	27,900		79,800
October	172,800	19,800		96,600
November	169,200	20,700	168,000	54,300
December	117,000	128,000		56,300
Total for 1921	1,646,000	434,800	514,200	596,400*
1922				
January	88,700	36,600	139,000	68,200
February	64,600	55,800	First	66,900
March	63,800	67,300	Quarter	105,700
April	59,900	89,100	.....	129,000
May	60,900	41,100	.....	154,300
June	52,800	.....	.....	.....

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	754,700	250,200	101,300	49,000
Monthly average 1921..	302,100	254,500	65,000	62,300
1921				
January	493,400	263,700	119,100	70,800
February	483,500	259,600	98,400	62,000
March	359,100	246,900	96,300	19,700
April	70,600	252,600	108,700	57,100
May	5,700	240,400	62,800	56,100
June	2,700	240,800	54,200	61,000
July	117,200	219,500	26,900	57,100
August	434,100	228,600	27,800	55,100
September	429,300	232,100	34,000	76,200
October	405,400	255,900	41,900	81,800
November	443,800	272,700	46,200	69,900
December	381,000	297,600	63,200	80,700
Total for 1921	3,625,800	3,010,400	779,500	747,500
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	.....	112,500	.....
August	520,800	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	516,900
Average monthly 1919..	186,100	19,400	14,500	.....
Average monthly 1920..	271,100	74,600	74,300	143,600
1921				
January	232,400	89,300		
February	166,900	125,800	294,000	503,600*
March	148,900	122,700		
April	160,100	117,400		.....
May	99,000	96,900	241,300	127,800
June	64,700	109,100		159,700
July	64,000	87,600		175,000
August	76,500	122,500	192,300	236,300
September	133,300	171,200		221,800
October	155,800	188,300		242,300
November	193,500	167,400	176,000	230,600
December	205,300	131,700		212,900
Total for 1921	1,700,400	1,529,900	903,600	2,110,000*
1922				
January	253,300	164,000	198,400	218,200
February	223,400	107,000	First	170,000
March	295,800	72,300	Quarter	208,700
April	258,400	125,800	.....	195,500
May	272,400	122,200	.....	204,500
June	236,300	.....	.....	.....

*Provisional estimate. Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1922		
July	44,384	156,392
June	24,101	216,298
May	17,292	229,616
April	15,884	197,562
March	8,612	206,474
February	10,216	133,333
January	10,511	155,822
1921		
December	9,400	134,348
November	9,296	125,492
October	16,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818
1920		
December	15,120	499,780
November	50,995	434,290
October	39,707	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,128	419,064
April	29,681	395,583
March	38,377	426,446
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
December	39,806	254,780
November	42,826	336,994
October	40,698	302,459
September	43,567	363,531
August	28,987	396,743
July	28,258	287,685
June	21,056	561,020
May	17,885	422,282
April	16,560	396,813
March	17,632	367,224
February	12,302	344,180
January	16,913	371,579
Total	327,490	4,405,281
1918		
December	28,996	356,641
November	11,382	471,427
October	15,744	426,767
September	8,440	473,688
August	12,520	512,104
July	11,511	452,759
June	15,913	418,605
May	14,387	488,515
April	11,371	462,887
March	14,345	379,924
February	12,941	438,848
January	12,475	490,259
Total	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,040
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

Making Your Bank Book Smile

When you receive a check which represents a sum received for the sale of something which is no longer of use you have completed the best kind of a deal; for you have turned *nothing* into *something;* you have made dollars blossom forth where none were before.

This unexpected money is happy money to your bank book. Every such entry you can make is a convincing testimonial to your administrative ability.

Look around now and see what you have for sale. Somebody wants it. There is always a market for Plant Machinery, Worthy Patents, Business Property, Serviceable Materials and Office and Plant Equipment. Advertise it in the Classified Advertisement division of THE IRON TRADE REVIEW. The cost is low—only $5.00 for an inch advertisement or $9.50 for two inches.

Write out your advertisement today. Describe what you have for sale. Do not be too brief for your description must be clear to the reader. At the most the cost of the advertisement will be an inconsequential fraction of the worth of the articles you have for sale.

Always read the classified advertisements. Pages 119 to 127, this issue

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$15.00 to 20.00
Boston (dealers)	15.50 to 16.00
Buffalo	19.50 to 20.50
Chicago	19.50 to 19.75
Cincinnati	16.50 to 17.50
Cleveland	20.00 to 20.25
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	13.50 to 14.00
Pittsburgh	21.50 to 22.00
San Francisco	11.50
St. Louis	18.00 to 18.50
Valleys	22.00 to 22.50
No. 1 railroad steel New York (dealers)	14.25 to 14.75

BUNDLED SHEETS

Buffalo	$14.00 to 15.00
Cleveland (hydraulic)	17.25 to 17.75
Cincinnati	13.00 to 14.00
Eastern Pennsylvania	15.50 to 16.50
Pittsburgh	17.00 to 17.50
St. Louis	9.00 to 9.50
Valleys (hydraulic)	19.50 to 20.00

STEEL RAILS, SHORT

Birmingham	$16.00 to 17.00
Boston (dealers)	15.50 to 16.00
Chicago	21.00 to 21.50
Cincinnati	17.50 to 18.00
Cleveland	16.25 to 17.00
St. Louis	21.00 to 21.50

STOVE PLATE

Birmingham	$19.00 to 20.00
Boston (consumers)	17.00 to 17.50
Buffalo	17.00 to 18.00
Chicago	19.75 to 20.25
Cincinnati (net)	15.00 to 16.00
Cleveland	17.00 to 17.75
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	14.50 to 15.00
Pittsburgh	18.00 to 18.50
St. Louis	18.00 to 18.50

LOW PHOSPHORUS

Buffalo	$21.00 to 22.00
Cincinnati	18.00 to 18.50
Eastern Pennsylvania	22.00 to 23.00
Pitts. billet and bloom crops	24.50 to 25.00

SHOVELING STEEL

Chicago	$18.25 to 18.75
Pittsburgh	17.50 to 18.00
St. Louis	17.50 to 18.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	$22.50 to 23.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	24.50 to 25.00
St. Louis	23.50 to 24.00

COMPRESSED SHEETS

Buffalo	$18.00 to 19.00
Chicago	15.50 to 16.00
Pittsburgh	19.00 to 20.00

FROGS, SWITCHES, GUARDS

Chicago	$18.50 to 19.00
Eastern Pennsylvania	18.00 to 19.00
St. Louis	19.75 to 20.25

BOILER PLATE, CUT

St. Louis (dealers)	13.00 to 13.50

ANGLE BARS—STEEL

Chicago	$20.00 to 20.50
St. Louis	20.00 to 20.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$20.00 to 22.00
Boston (dealers)	16.50 to 17.00
Buffalo	19.00 to 20.00
Chicago, No. 1	20.50 to 21.00
Chicago, No. 2	19.00 to 19.50
Cincinnati, No. 1	15.00 to 16.00
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	22.00 to 23.00
Pittsburgh, No. 1	19.00 to 20.00
Pittsburgh, No. 2	21.50 to 22.00
New York, No. 1 (dealers)	16.00 to 16.50
St. Louis, No. 1	19.50 to 20.00
St. Louis, No. 2	19.00 to 19.50

WROUGHT PIPE

Boston (dealers)	$12.00 to 12.50
Buffalo	14.00 to 14.50
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	11.75 to 12.25

YARD WROUGHT

Boston	$14.00 to 15.00
Eastern Pennsylvania, No. 1	20.50 to 21.50

CITY WROUGHT

New York, long	$13.50 to 14.00

BUSHELING

Buffalo, No. 1	$17.00 to 18.00
Chicago, No. 1	17.25 to 17.75
Chicago, No. 2	10.00 to 10.50
Cincinnati, No. 1	14.00 to 15.00
Cleveland, No. 1	15.50 to 16.00
Cleveland, No. 2	13.50 to 13.75
Eastern Pennsylvania, No. 1	17.50 to 18.00
Pittsburgh, No. 1	18.00 to 18.50
St. Louis, No. 1	15.75 to 16.75

MACHINE SHOP TURNINGS

Birmingham	$9.00 to 10.00
Boston (dealers)	10.50 to 11.00
Buffalo	14.50 to 15.50
Chicago	13.00 to 13.50
Cleveland	14.25 to 14.50
Cincinnati (net)	13.00 to 14.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	11.25 to 11.75
Pittsburgh	16.00 to 16.50
St. Louis	11.00 to 11.50
Valleys	16.75 to 17.00

CAST IRON BORINGS

Birmingham (chemical)	$15.00 to 16.00
Birmingham, borings (plain)	12.00 to 13.00
Boston (chemical)	15.50 to 16.00
Boston (dealers)	14.00 to 15.00
Buffalo	17.00 to 18.00
Chicago	15.50 to 16.00
Cincinnati (net)	13.00 to 14.00
Cleveland	15.00 to 15.50
Eastern Pennsylvania	16.50 to 17.00
Eastern Pennsylvania (chemical)	23.00 to 25.00
Pittsburgh	17.50 to 18.50
New York (dealers' price)	12.50 to 13.00
St. Louis	13.00 to 13.50
Valleys	18.00 to 18.75

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	$10.50 to 11.00
Cleveland, small	15.00 to 15.25
Eastern Pennsylvania	14.00 to 15.00
New York (dealers)	11.25 to 11.75

IRON AXLES

Birmingham	$23.50 to 25.00
Boston	27.00 to 28.00
Buffalo	24.00 to 25.00
Chicago	29.50 to 30.00
Cincinnati	23.00 to 24.00
Eastern Pennsylvania	25.00 to 30.00
New York (dealers)	23.00 to 24.00
Pittsburgh	29.00 to 30.00
St. Louis	29.50 to 30.00

IRON RAILS

Buffalo	$19.00 to 20.00
Chicago	23.50 to 24.00
Cincinnati	16.00 to 17.00
Cleveland	18.00 to 18.50
St. Louis	20.00 to 20.50

PIPES AND FLUES

Chicago	$14.25 to 14.75
Cincinnati	12.00 to 13.00
Cleveland	15.00 to 15.50
St. Louis	12.00 to 12.50

RAILROAD GRATE BARS

Buffalo	$16.00 to 17.00
Chicago	20.25 to 20.75
Cleveland	17.00 to 17.75
Eastern Pennsylvania	16.50 to 17.50
New York (dealers)	12.00 to 12.50
St. Louis	18.50 to 19.00

FORGE FLASHINGS

Boston (dealers)	$11.50 to 12.00
Chicago, small	12.00 to 12.50
Cleveland	15.50 to 16.00
Cleveland, large	14.50 to 15.00

FORGE SCRAP

Boston	$11.50 to 12.00
Chicago	19.00 to 19.50
Eastern Pennsylvania, No. 1	16.00 to 17.00

ARCH BARS AND TRANSOMS

Chicago	$25.50 to 26.00
St. Louis	24.50 to 25.00

ANGLE BARS—IRON

Chicago	$25.50 to 26.00
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$11.50 to 12.00
Buffalo	17.50 to 18.50
Chicago	15.50 to 16.00
Cleveland	17.00 to 17.25
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	18.00 to 18.50
St. Louis	13.00 to 13.50

STEEL CAR AXLES

Birmingham	$22.00 to 23.00
Boston (dealers)	23.50 to 24.00
Buffalo	21.00 to 22.00
Chicago	22.00 to 22.50
Cleveland	26.00 to 27.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	17.00 to 18.00
Pittsburgh	24.00 to 24.50
St. Louis	23.00 to 23.50

SHAFTING

Boston (dealers)	$18.50 to 19.50
Chicago	25.00 to 25.50
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	16.00 to 16.50
St. Louis	20.00 to 20.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$19.00 to 20.00
Birmingham, tram car	22.00 to 23.00
Boston (consumers)	18.50 to 19.50
Buffalo, iron	21.00 to 22.00
Chicago, iron	24.50 to 25.00
Cincinnati	19.00 to 19.50
Cleveland, iron	13.00 to 13.50
Eastern Pennsylvania, iron	22.00 to 23.00
New York, iron (dealers)	15.00 to 16.00
Pittsburgh, iron	23.00 to 23.50
Pittsburgh, steel	24.50 to 25.00
St. Louis, iron	25.00 to 25.50

NO. 1 CAST SCRAP

Birmingham, cupola	$20.00 to 23.00
Boston (consumers)	22.00 to 22.50
Buffalo	21.00 to 22.00
Chicago, cupola	24.00 to 24.50
Cincinnati, No. 1, machinery, cupola (net)	19.50 to 20.00
Cleveland, cupola	22.00 to 22.50
Eastern Pennsylvania, cupola	23.00 to 25.00
New York, cupola dealers)	17.50 to 18.00
Pittsburgh, cupola	23.00 to 23.50
San Francisco	26.00
St. Louis, agricultural	23.50 to 24.00
St. Louis, railroad	24.00 to 24.50
Valleys	21.00 to 21.50

HEAVY CAST

Boston (consumers)	$19.50 to 20.00
Buffalo	18.00 to 19.00
Cleveland	17.00 to 17.25
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	16.50 to 17.00
Pittsburgh	21.00 to 21.50

MALLEABLE

Boston (railroad)	$18.50 to 19.00
Buffalo	20.50 to 21.50
Chicago, railroad	24.50 to 25.00
Chicago, agricultural	24.50 to 25.00
Cincinnati, agricultural	16.00 to 17.00
Cincinnati, railroad	17.00 to 18.00
Cleveland, agricultural	18.50 to 19.00
Cleveland, railroad	20.00 to 21.00
Eastern Pennsylvania, railroad	21.00 to 22.00
Pittsburgh, railroad	22.00 to 22.50
Pittsburgh, agricultural	18.00 to 18.50
St. Louis, agricultural	22.00 to 22.50
St. Louis, railroad	22.00 to 22.50

Miscellaneous Scrap

RAILS FOR ROLLING
3 feet and over

Birmingham	$19.00 to 21.00
Boston (dealers)	15.50 to 16.00
Chicago	20.50 to 21.00
Cleveland	24.00 to 25.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	13.50 to 14.50
Pittsburgh district	24.50 to 25.00
St. Louis	21.50 to 22.00

LOCOMOTIVE TIRES

Chicago	$19.50 to 20.00
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$19.50 to 20.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	24.00 to 25.00